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ABSTRACT

The Midwestern Conference for Visiting Fulbright-Hays Scholars, held at Ohio State University, May 14-16, 1973, was designed to be a forum for international cultural exchange of ideas between scholars with transnational interests. The theme was "Universities and Transnational Approaches to the Solution of World Problems." One primary objective of the conference was to give this group of academicians an opportunity to make a contribution to an ongoing discussion of contemporary relevance. Emphasized was the need for the development of a community of scholars who would be able to free themselves from national and cultural bias. The establishment of the United Nations University was the primary thrust of the lectures and discussions. The reports include articles concerned with the United Nations University, its staffing, programs, students, and transcultural emphasis. Discussion reports include environmental pollution problems, university studies toward the achievement of world peace, the uses of modern communication media, and human resource development. Appendices include conference programs, participants, committee members, and photographs of conference participants. (Author/PG)

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Osborn T. Smallwood
Editor

A Report on the 1973 Midwestern Conference for Visiting Fulbright-Hays Scholars at The Ohio State University, May 14-17, 1973

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Sponsored by

The Committee on International Exchange of Persons

The Bureau of Educational and Cultural Affairs,
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The Mershon Center,
The Ohio State University

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The Ohio State University
1973

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Introduction

Osborn T. Smallwood

Director of International Programs
and Professor of Speech Communication
The Ohio State University

The Midwestern Conference for Visiting Fulbright-Hays Scholars, held at The Ohio State University, May 14-16, 1973, was designed to be a forum for intercultural exchange of ideas between scholars with transnational interests. The theme was "Universities and Transnational Approaches to the Solution of World Problems." Contributing to the deliberations were thirty-one Americans and thirty-eight foreign scholars from seventeen countries. Of particular importance from the viewpoint of intercultural communications is the fact that there was a substantial representation from the East as well as the West, from socialist as well as capitalist cultures. Following are the countries represented and the number of scholars from each: Australia (4), Austria (2), Chile (2), Finland (2), France (2), Germany (2), Greece (1), Iran (1), Italy (1), Japan (2), Norway (1), Poland (3), Rumania (9), Turkey (1), United Kingdom (1), Yugoslavia (3), Zambia (1). All foreign participants were within weeks of completing a year of teaching or research in the United States.

The conference was the culmination of two years of planning by a committee of faculty members at The Ohio State University. This committee envisioned an open and honest intercultural exchange by scholars, representing various cultures, uninhibited by governmental influences. It was decided, therefore, that no discussions would be

taped and no attribution of comments or recommendations by any individual participant in the conference would be made, with the exception of the principal speakers, of course. It was further agreed that no indication would be given as to which participants were members of the individual panels. The conference was not designed to arrive at any consensus; however, considerable agreement developed among the participants concerning the issues under consideration.

One primary objective of the conference was to give this group of academicians an opportunity to make a contribution to an ongoing discussion of contemporary relevance. Emphasized was the need for the development of a community of scholars who would be able to free themselves from national and cultural bias. The debate presently raging over how the international education resolution adopted by the United Nations on December 11, 1972, should be carried out provided an excellent basis for the discussion. The resolution provided for the establishment of a United Nations University which is to help serve the needs of humanity. How this objective is to be achieved in the contemporary world of nation-states was the primary thrust of the lectures and discussions. That the effort met with some success is indicated by the following comment from one of the foreign scholars: "I understood for the first time how much a discussion group is able to achieve."

In considering the topic before them these scholars faced certain fundamental questions concerning the politics, organization, and administration of the United Nations University which would determine its effectiveness as a stimulating and coordinating mechanism. How can academic freedom be maintained? How can political influence be minimized? To what extent is intercultural communication influenced by cultural bias and what can be done to minimize this influence? What policies should be adopted and mechanisms created to assure effective transnational cooperation among scholars? To what end should transnational cooperation be directed? Should problem solving be its primary concern? changing attitudes? inculculating new values or new measures of values? alternative models for organizing society? techniques of social change? the containment of violence, both intra- and internationally? Is it possible to develop an international community of scholars who, in the context of a university structure, can make a significant contribution toward alleviating the major problems plaguing the human family: war, poverty, environmental pollution, maldistribution of natural and human resources?

Of special concern to this group of scholars was the relationship between the developed and the developing nations. How are nations to maximize the use of their human and natural resources? How is progress to be measured? To what extent should developing nations accept standards imposed by the more advanced countries? Given

such a concept as "human capital," how are investments to be divided between human capital and material capital in development planning? How should priorities for the appropriate application of science and technology be determined in developing countries? Should less developed countries conduct their own projects for research and development or should they, rather, purchase patent rights from advanced countries?

The presentations which provided the basis of the discussions were delivered by scholars who themselves represent the transnational orientation which the conference was designed to encourage. Ward Morehouse and Harold Taylor have been among the educational leaders who have distinguished themselves in research concerning the development of a university under the aegis of the United Nations. Their observations were, therefore, of considerable interest to the conference participants. Ward Morehouse set the stage for the discussions by reviewing the essential facts concerning the plans for the establishment of the United Nations University and called to the attention of the audience the greatest challenge which faces this new institution, namely to move beyond bias, "whether of East or West, North or South, rich or poor, toward true universality." Harold Taylor, former President of Sarah Lawrence College, brought to bear his tremendous knowledge of the international student movement as well as his revolutionary educational philosophy which radiates provocative and seminal concepts. Taylor pleads for a redefinition of the university so that it may cease to be an "educational institution functioning on behalf of governments and on behalf of the status quo. The university must be redefined so that it becomes a center for the study of issues affecting world society and human welfare." The suggestion is that universities could become instruments of peaceful social change as well as contribute to the solution of major problems confronting mankind.

In addressing himself to curriculum reform Richard C. Snyder, former President of the International Studies Association and the Director of the Mershon Center, both of which functions suggest the depth of his commitment to transnational research, tantalized his audience with the possibility that modern technology conceivably would enable universities to achieve the development of the "renaissance man," a truly universal and transnationally oriented human being. He asked the participants to "consider the possibility that with creative use of certain modern technological developments we may discover some noncognitive ways of communicating with each other and indeed communicating abstract ideas and relationships without having to go through the laborious business of translating or providing carefully controlled behavioral settings. In other words, we may have within our grasp a way to depoliticize language." He would emphasize

"interdependence" and seek "a common social education which might appeal to a wide range of young people and adults inside and outside the university." The curriculum revision envisioned by Snyder involves considerably more than reexamining courses. He pleads for a new application of the communication process so as to enhance the effectiveness of "cross-societal" learning and produce a reexamination of the basic values which contribute to intercultural conflict.

There are few problems facing the human family which are more critical than that of the relationship of the developed nations to the less affluent ones who are seeking the means adequately to meet the basic needs of their people. Professors Richard S. Eckaus and Samuel C. Kelley, distinguished economists who have been involved in development research, accepted this significant problem as the burden of their presentations to the conference. Both were concerned with the maximizing of resources—human and material. Kelley suggested that there is no adequate theory of economic development, thereby encouraging his multicultural audience to seek one. He pointed out that the hoped for increase in economic welfare in a comparable degree to educational development has not materialized. Such anticipated progress is not to be expected "in the absence of comparable and consistent presumptions for cultural change and for the development of human capacities for socialization and performance in a complex, specialized, industrial economy." Compounding the problem is the need also for an adequate theory of social change, asserted Kelley. His solution is to break down the barriers between disciplines. "If we want to maximize the contribution of human resources as agents for human progress, we need new forms of human resource development. The human capacity for innovation needs to be applied to those institutions which are the principal source of innovation. We can not manage this in specialized, intellectual isolation from each other." Eckaus impressively complemented Kelley's presentation as he focused on science policy in the choice of technology by developing countries. He urged a reexamination of the concept that the less developed nations should grow into the image of the advanced ones. Food production, health, population growth, relationships between unemployment and output and the adaptation of technological choice to the goals of the society are factors which are essential to the determination of what truly constitutes "appropriate technology" for developing nations. Following analysis of the problems involved, Eckaus alerted the conference participants to the need for the establishment of a methodology for science policy making "which is something better than informed guesses by experienced men."

The discussions following the lectures are summarized in this report. Chairmen and rapporteurs were members of the Ohio State

faculty who were chosen for their recognized ability to stimulate and evaluate group discussions. In this manner an effort was made to encourage maximum participation in the discussions by the visiting scholars. The Ohio State University faculty members involved are listed in connection with the respective reports of the discussions. For their contributions to this conference I am very grateful.

A debt of gratitude is due to the many other persons who contributed to the success of this international event. The members of the Planning Committee played a vital role in determining the content and administration of the meeting. Members of the staff of the Office of International Programs at The Ohio State University rendered valuable assistance. To Richard L. Cameron, for administrative assistance, and David Treadwell, who on special assignment helped with the editing of this report, I am particularly indebted. Alice E. Lovely, Executive Associate of the Committee on International Exchange of Persons provided guidance and support which were invaluable for the success of this project. Finally, on behalf of the international academic community I wish to express appreciation to the Committee on International Exchange of Persons, the Department of State, and the Mershon Center, Ohio State University, for the financial support which made the conference possible.

The Universities and Transnational Approaches to World Problems

Harold Taylor

Dr. Taylor, who delivered the keynote address at the conference, is the former President of Sarah Lawrence College, where he served for fourteen years. Among the seven books he has published dealing with education and world affairs are *How to Change Colleges: Notes on Radical Reform* (1971) and *Students Without Teachers: The Crisis in the University* (1969). The *New York Times Book Review* referred to *Students Without Teachers* as "a blueprint for radical change in the whole style and purpose of our colleges and universities." Dr. Taylor is widely known for his contributions to the development of ideas for the United Nations University. In addition to his research, writing, and speaking, he serves as Director of the World University Student Project.

The University Curriculum in Relation to World Issues

In the past two months the Costa-Gavra film, *State of Siege*, has come to the United States, having won an award at the Cannes Festival last year, and having been selected, inadvertently, I gather, by the sponsors of the American Film Institute, to open a series of films at the Kennedy Film Center, in Washington. The film has to do with the assassination by urban guerrillas of a member of the American AID staff, in a mythical Latin American country. Actually the country referred to is Uruguay. The central character in *State of Siege* is a version of Dan Mitrione, who had learned how to run police forces and how to keep law and order in the state of Indiana, and had been employed

by AID to help in Latin America with the problem of keeping insurgents in line.

State of Siege is a film which occupies that borderline between the documentation of reality and the invention of a reality of one's own. This is the mark of other films, including Costa-Gavras' *Z* and *The Battle of Algiers*, where Franco Solinas, the screenwriter, also collaborated. *State of Siege* raises serious issues among artists who are politically radical and politically concerned with world affairs. It raises issues of which terrorism is only one.

On the face of it, the assassination or kidnapping of a public official by urban guerrillas, holding the official for ransom, demanding money and certain political advantages from the government in power seem to be the use of terror by thugs to achieve ends which only violence and the use of terror, it is assumed, can reach—an equivalence of the Palestinian guerrilla capture and assassination of the Israeli athletes.

But when one probes beneath both the surface of the film and the surface of the concepts on which the film is based, one finds a series of problems nesting together which are in a large sense transnational. These are issues not usually dealt with by the universities, or introduced into the university curriculum.

Let me say something about how these concepts are linked together. If we begin to look at the phenomenon of terrorism in the contemporary world, whether the mass terrorism of the U.S. bombing of Indochina or the attacks by the United States on Indochinese peasants, we see that this is a larger version of the terrorism which is to be found wherever violence is used to achieve political, social and economic ends. It is part of the same general problem of the use of war and violence to achieve political ends, of which the United States activities in Indochina are simply one aspect.

We then also notice that the urban guerrillas of Latin America belong to an educated minority and that both in *State of Siege* and in the revolutionary mythology, are considered to be in some sense political heroes of the same stripe as Che Guevera in his effort to bring the revolution to Bolivia and other Latin American countries. The mystique of the revolutionary hero is a significant aspect of the use of urban guerrilla tactics in the capture of public officials to achieve political ends.

But when one goes beneath the act of terrorism, whether it results in assassination or the public official's being released under certain conditions, we find it linked to social, economic, and political conditions in the countries themselves. The urban guerrillas are fighting what they consider to be a war against a repressive government which uses torture, police tactics, and military power to hold down the poor, the oppressed, and the victims of society. Those things emerge when one

takes seriously a film of the sort represented by *State of Siege*. The fact that the film is a popular success means that a considerably large number of Americans will have a chance to confront the issues of terrorism.

It seems to be if we are going to talk about world problems in the universities, we need to talk about these issues as they are linked to poverty and social justice. That is what the film is about, what the major issues in world society are about, and what too few institutions of education deal with. When we look at what is happening in Southern Africa, we find the Rhodesians refusing to have anything to do with the African Organization Council, which believes in non-violent response to the problems of blacks and whites. We find that in refusing even to talk with those who wish to find non-violent solutions to the race problem of Rhodesia, the Rhodesians automatically invite guerrilla warfare in Zambia and Tanzania, with infiltration of Rhodesia and whites being killed by blacks in a terror campaign. The terrorists are fighting to achieve the kind of social justice which any revolutionary movement working within a repressive society against a repressive government has to take in order to establish a new kind of social order. When we look at world problems as scholars, intellectuals, and students of history, we find an oversimplified and unreal version of world problems in the university curriculum.

We also find that in the mass media—in films, TV, and press reports—the materials of contemporary world affairs are much more vividly drawn, much more vividly presented as moral, political, social, and economic issues than they are in the curricula of the schools, colleges, or universities. We find that the universities have therefore much less influence in relation to the society whose values they represent and almost no influence at all on the students who attend them.

That is to say, in terms of giving intellectual and moral sustenance to the students themselves, the students find very little in the curriculum of political science, the humanities, or history which provides spiritual substance for a new generation deeply interested in what amounts to a world-wide revolution, in which the victims of previous oppression under a colonial world society have now refused to accept that colonial status any longer. In the case of the Portuguese of Mozambique, or the whites of Rhodesia, or in the case of other countries, there is a deliberate effort on the part of the governing authorities to keep the population as permanent victims of government policy.

I cite Rhodesia as only one example. In that country a newspaper reporter writing for the *Manchester Guardian* was detained in solitary confinement simply because he had written true stories about the whites and the blacks in Rhodesia. When at last he was released, it was not by the pressure of the universities in Rhodesia or anywhere else (in Rhodesia the universities are powerless to control or to affect public

policy), but by an international movement of intellectuals and concerned persons working against the policy. When Peter Nieswand was released, he left behind 120 other intellectuals, journalists, and citizens in jail, where some of them have been for nine to twelve years, where others are perhaps never going to be released until there is a revolution in Rhodesia which overthrows the present administration. Then quite possibly we will have a different set of people in jail.

Role of the University in Political and Social Revolution

The role of the university as the resource center for non-violent political, social, and intellectual change, is perhaps best explained by considering the university as one part of a political and social revolution of world-wide significance. I find language which best describes my own view of what has happened in an address by Robert Oppenheimer at Columbia University in 1954. Oppenheimer said this: "The unity of knowledge, the nature of human communities, the order of society, the order of ideas, the very notions of society have changed, and will not return to what they have been in the past. What is new is not new because it has never been before, but because it has changed in quality, . . . so that the world alters as we walk in it, so that the years of a man's life measure not some small growth or rearrangement or moderation of what he learned in childhood, but a great upheaval."

What we are facing, as Robert Oppenheimer has said, is a great upheaval. It can be expressed in various ways, but I suppose the term, social revolution on a world scale, is an appropriate one. The upheaval has to do not only with a shift in social and economic institutions, but with a shift away from the centralized authorities of world society which were formerly located in Western Europe and in a Western world which controlled Africa, Asia, and Latin America under the colonial system. It is a loss of authority on the part of central areas where military, economic, and social power were formerly located, and where the whites in the West had essential power of control over the colored people of the rest of the world.

The disintegration of the colonial system has been matched by disintegration of other centers of authority, including the loss of effect by religious organizations in the western world, the loss of political influence by various forms of capitalist society, and the shift away from the conventions of education and of social institutions which were simply taken for granted before the Second World War. Part of that upheaval has affected the universities. There is scarcely a country in the world which is not having trouble with its students. The students are in many cases refusing to accept the social, economic, and intellectual conditions of their own society. An example is the pro-

tests of the Greek students in these past two months, where students have protested publicly against the policies of a repressive military government, and have refused to accept the regulations put upon them. They protested against student elections supervised and rigged by the government itself, and nine students who made a formal protest on behalf of the others were dismissed from the university, five of them jailed and the rest sent to the military service. A rule was then made by the government that anyone who said anything in criticism would go straight out of the university into the military service. Not only that, at the next stage, six lawyers who took up the case of the students who were jailed have themselves been jailed and have been held *incommunicado*—another word for being tortured.

That is the way in which one society is treating its students. A situation not quite as severe exists in Spain, one in which the Spanish students called a strike in December of last year at the University of Madrid to protest the killing of a student in Salamanca. At the University of Delhi, last December, students closed down the university with a strike over what they considered to be authoritarian policies of the Indian government.

If we look at the problems of world society from the point of view of students, we can begin to find some common factors in a global community in which the communication system, whether by film, television, the press, or by word of mouth, has superseded the flow of scholarly knowledge which was typical of 19th century and early 20th century university life. We find that there are other institutions of communication more powerful and influential than the universities themselves and that this is part of the upheaval about which Robert Oppenheimer spoke, part of the basis on which he made the statement that the world alters as we walk in it. The situation in world society in relation to the universities changes so fast that it is almost impossible to keep up with these changes unless one has a communication network of scholars reporting to a central place about what is happening from moment to moment.

There are, by the last count I have been able to make, sixty-seven countries right now where there exists some form of student protest or student rebellion rising to the level of public demonstration, strikes, or withdrawal from the universities. This phase goes back to the middle 1960's, having reached its height in Europe in the French student revolt in 1968, a time in which the students very nearly brought the government of France down and hastened DeGaulle's departure from office.

These ideas about the rights of citizens (and by citizens I also mean students, since students are acting on behalf of other citizens) have circulated along paths which formerly did not exist. We have never had a mass communication system of the size and scope we now have.

In the past, the word about what the universities have been doing has come from scholars and from scholarly publications.

In the 1970's when Solzhenitsyn publishes a novel or when he is censored by the Soviet government, everyone in the Western world, and pretty soon everyone in the world's intellectual community, knows about it. People begin reading novelists like Solzhenitsyn in order to discover what a major novelist in the Soviet Union is saying about contemporary Soviet society. This was not true even ten years ago. No one planned to build a communication system among intellectuals, but such a system now exists. Among other things, new forms of painting, of dance, of sculpture, of poetry, of plays, of literature are now more available on a world scale than ever before. We may now be concerned with the fate of a Soviet ballet dancer who is dismissed for political reasons from the Kirov company; dancers all over the world know about it and care about it, and, if they had political and social power, would act to prevent it

In any event, there is a change in consciousness, as a result of the change in the communication system. This has meant, as I have already said, a lessening of influence of the universities in the societies in which they exist. For example, as far as influence on students in Western and Eastern Europe or in Africa is concerned, they are more likely to be influenced by novels, plays, poetry, and reports on contemporary society written outside the universities than they are to be influenced by anything they receive in the curriculum of the university itself. Their intellectual and personal interests, outside the natural sciences, move in the direction of the study of social, political, and economic issues which are of importance to contemporary intellectuals outside the universities. One is more likely to find an activist student who is interested in Africa reading Frantz Fanon than studying sociology seriously in a conventional curriculum. This has certain advantages and disadvantages, but it is a fact, and the intellectual influence of universities on their students has declined as far as their work in the areas of politics, social change, and the humanities is concerned.

The University as a Political Institution

The response of the universities to these changes has been of a particular kind. I have described the response of governments in various countries and the repressive measures taken by certain of them. But it is important to report also on what seems to be happening among the faculty members of the world's universities and among the educational administrators. Of course nearly all the educational administrators outside the west and a great many of them inside, are employed by

their governments. In the United States the university president of the state university is an appointee of a Board of Regents, the Board of Regents is appointed by the Governor of the state, and to this extent the presidency of an American public university is a political appointment, perhaps not in the same sense as it would be at Charles University in Prague, or at the University of Indonesia in Jakarta, but nevertheless it is a political appointment. In other cases outside North America, the rector or vice-chancellor is elected by the university faculties, although once elected he too is subject to political and governmental pressures. Those appointed by the government in power are likely to do the bidding of the government in power. The others are held responsible for supporting government policy, law and order.

Therefore, when there are student protests or demands for change, either in the curriculum or in the structure and governance of the university, the university president and his faculty are responsible to the state for their own continuing survival, not to the students and not to the larger ideals of the society itself.

I would say that in 75 to 80 percent of the world's universities, the response of the universities themselves to the known problems of the students and of the society is one of obedience to government edict rather than leadership in a political and social sense. I choose one example to illustrate the general principle—the example of the Italian student movement.

Beginning in 1967 there were sporadic efforts by students in the Italian universities, in Turin, Rome, Florence, Milan, to form work-study groups in which the student intention was to develop alternate systems of study, without lectures and the conventional system. The students aligned themselves with sympathetic faculty members who agreed to teach them without lecturing at them, and agreed to take an interest in involving the students in the process of their own education. It was an effort to regain a sense of community in the true sense of what a university should be.

The students found that there were too few faculty members who would have anything to do with the idea. As you all know, in many of the universities of the world, faculty members are part-time people who teach for various reasons but whose interest in students is minimal and whose attendance at the university itself is confined to walking in, doing a lecture, sometimes one or two lectures a week—and many of these lectures are not worth listening to. This is a world phenomenon and not simply a local one confined to Italy.

In the case of the Italian universities, the idea that the students could work on educational reform with sympathetic faculty members became lost in the shuffle when the students could not find the faculty to work with. They then turned to a harder line and began to form what they

thought of as an "autonomous space" on the campuses. By 1968 they were following the French lead by deliberately using the campuses as the base for a political operation to make the revolution. The allies they sought were the workers, peasants, and the high school students. They had more luck with the high school students than with the workers and the peasants, since their aim was to destroy the university and its structure in order to make a revolution and to build a movement which would bring down the government. Finally by 1969 and 1970 the government did begin paying attention and began the laborious process of parliamentary maneuvering for change. The legislators brought in some proposals for change which are still being debated while the Italian education system retains most of its obsolete ways.

I quote from a scholar writing about the situation in Italy, Frederico Mancini. "Many a progressive member of the faculty felt that by agreeing to join the study group he was contributing to a self-regeneration of the university of whose wretched conditions he was agonizingly aware. The student movement leaders did not conceal their revolutionary intentions. But their liberal professors hoped that while they remained revolutionary, practice could be steered along reformist lines. In time, they thought the dross (that is, the inordinate politicizing, the lack of interest in cool research) would be jettisoned; the substance (more vivid seminars and fewer drab lecture courses, more contact between teachers and students) would stick. Such delusions were soon exposed, but for once it is not the students who should be blamed for the liberals' defeat. . . . The blame lay on Academe as a whole. The universities might have taken up the student challenge by reforming themselves. . . .Cynical shrugs, condescending conversation, or vindictive indignation at 'those cranks' were the reactions of most Italian faculty members." After that came the student takeover.

I cite the Italian experience and Mancini's description of it as one instance of a phenomenon which is world-wide. The approach of the universities on a world scale to the genuine needs of a new generation of students has in general been one of lethargy. Let us keep things as they are, let us make sure that the students do not gain real power in the decision-making, or in those areas of social change where the demands of the young people differ from those of the older generation.

On the other hand, the facts of the university situation are that in the long run the changes are unavoidable, and they are going to force the universities into a different role in world society and their own societies. The first change is that the numbers of students in higher education will continue to increase. In some cases, as at the University of Delhi, in a period of ten to fifteen years the student body has gone from something like 15,000 to 20,000 students up to 85,000 to 90,000, without any accommodation of the university structure to a qualita-

tively different situation. If there are 95,000 students officially enrolled (no matter whether they come to the campus, because if they all came at the same time, there wouldn't be any place to go) you have a mass situation, an assemblage of students the like of which has never occurred before in the history of New Delhi or in the history of India. No one has ever tried to deal with that many students in an open or enclosed area ever before.

The way in which those students have been dealt with in Delhi and elsewhere, has been by the same lecture system, the examination system, and by a curriculum which has not changed to meet the new intellectual, cultural, and social needs of the past twenty-five years. Therefore, the students became alienated from a university community which has no place for them. They have little relationship with professors and they have no relationship with the university as an institution. They then become alienated from the society, on the grounds that they have been led to believe that they would be the leaders of the future, and they then find that no one is paying attention to them and only in very few instances do they find the kind of employment they seek following graduation.

A second factor, which is a brute fact rather than anything that one can wish away, is that the students are seriously, and I would say, legitimately, making demands for a share in making educational and social policy. They see, as in the case of the French students who led their own rebellion, that admission to a university is a way of controlling the society, its politics, and its economic future. If only certain classes of persons in the given society are admitted, through having passed the correct examinations, what you have is a control mechanism through which you screen out the sons and daughters of the poor, or the ill-placed, the badly educated, and you continue a hierarchical society by the use of the university system.

That lies behind a great deal of the revolt in the Japanese universities, which have one of the most rigidly controlled examination systems in the world, a world which does a lot of controlling by examination. I say in passing that the college of which I was president had no examinations, and no grades, no lectures and no required courses, and if anyone would like a private discussion with me later about how we did it without all the conventional apparatus, I would be happy to talk with you. I should add that it is a transnational problem, but the world has not taken the Sarah Lawrence solution. In any event, it is a fact of life for the universities that students are insisting that they have a part in deciding on the curriculum, the methods of instruction, who shall be admitted, and the educational and social policies of the universities.

On the other hand, most of the universities have responded negatively to the demands, particularly when the students have taken to the

streets. The universities have sent for the police or the police have been sent by the political authorities and have engaged in the confrontations, fights, and struggles which have led to student violence on the one hand, and police violence on the other. The confrontation of students with police is a world-wide phenomenon.

Redefining the Role of the University

What then do we do about it? It seems to me that the first thing we must do is to redefine the role of the university from its present definition as an educational institution functioning on behalf of governments and on behalf of the status quo. The university must be redefined so that it becomes a center for the study of issues affecting world society and human welfare. If we are going to teach courses in political science that have to do with international relations, to mention one area, we should be teaching about the issues raised by films like *State of Siege,* issues which need to be raised in the context of world politics. We need to study the problems which are rocking the world, some of which are dealt with in the Security Council of the United Nations, or in some of the UN Committees, or in some of the areas of conflict which the United Nations is presently incapable of dealing with. We need to be studying these issues because universities owe it to the world society to make a contribution to the solution of its problems. Universities back away from the immediacy of real issues on the grounds that it is impossible to see them in historical perspective until at least fifty years afterwards. In my judgment, the issues of war and peace, of nonviolent social change, of poverty, of social justice should be given the central place in the curriculum of the social sciences and the humanities.

Let me give one example. Eight separate teams of scholars around the world have been organized over these past three years by the U.S.-based World Law Fund to do research projects on what they consider to be models for world order which would tackle the problems of poverty, of social justice, of social and educational development, and of the preservation of the planet. The eight teams, from as many regions of the world, are carrying out research on how to achieve the kind of world order in which those problems can find their way to solution. They have produced eight different versions of how to solve the world's problems and plans are now under way to introduce the research findings into the curricula of the world's universities.

The question is not whether these answers given by the research studies can actually change the world or whether the scholars can find solutions to which governments will immediately agree. The real question is, what contribution can the university scholar make to the

solution of world problems which, in one order of social phenomena, do consist in the four major areas of the prevention of war, the problems of poverty, the distribution of natural and human resources, and the protection of the planet. Research studies and curricula developed around those issues do respond to the need of contemporary world society for knowledge created by its universities.

Let me take another example. We can look at the Stockholm Environment Conference of last year as an extraordinary event in human history. It was the first time that the human race had organized itself on a world scale to consolidate the organized intelligence of mankind to deal with key issues in the global situation. To that conference came 1,400 journalists, 1,200 government representatives, upwards of 700 scientists and scholars, and 2-3,000 students, along with thousands of other uncounted citizens who were concerned to know what was going on in Stockholm in those particular two weeks in June.

But the extraordinary fact was that here you had the concentrated intellect of world society for the first time dealing with key problems in the world order. The United Nations University, if it is the kind of university it has set out to be, would simply be a continuation of those two weeks at Stockholm, with all-year-round activity in studying and working on global problems. The fact is that there were seven other conferences organized around the Stockholm conference, since there were so many issues in which the world's young people and other citizens were interested. The *Whole Earth Catalogue* people were there, with Stewart Brand pressing for an application of the *Whole Earth Catalogue* philosophy to the organized institutions of international society. The left wing, the right wing, the moderates—everybody was there. That kind of concern for global problems is what is now missing from the universities. It can be injected into university life by the work of the new UN University itself.

I suggest also that we take account of the world's volunteer student movement, including the International Student Volunteers who have volunteered for service through the United Nations. There are 130 young people from thirty-seven different countries at present working either in teams or in bi-lateral groups on problems in countries which need help from those who have some expertise in given fields. This is an extension of the idea of the Peace Corps into the international fields. But think what a revolution in education we could make if we organized the training of volunteers to deal with social, economic, agricultural, or scientific development as an essential part of the curriculum of the world's universities. Then we would be teaching people how to deal with world problems and how to understand the problems of cultures different from those in which they have been born and

brought up. The liberal arts and sciences then become practical arts, without losing their intellectual and spiritual content.

A year ago Pablo Casals came to the United Nations with his cello at the invitation of the UN, to lead an orchestra of distinguished musicians and to play a hymn to the United Nations which Casals had written, with a libretto by W. H. Auden. At the age of 93, his stocky little figure was before an audience representing the entire world. He was presented with the United Nations Peace Medal and was deeply moved. He said that the struggle for peace was something with which he had been involved all his life. Then he began to speak of his life as a boy in Catalonia. "My mother taught me about peace while there were many wars, and I learned what peace meant from my mother. I learned also about peace because of Catalonia."

Casals did not mention the rape of Catalonia by Franco. He did not mention the repressive Spanish government. Everyone there knew that he had refused to go back to Spain as long as Franco was in power, and that he was using the instrument in his hand and the power of his music to show to the world how mankind could be united. I thought at the time, and I bring you my recollection now, that it was because Casals was from Catalonia that he could become a world citizen. One of the enormously important things about the fact that our Fulbright colleagues from around the world have come to this country this past year to join with us in our universities, is that it is necessary to come from Belgrade, or from Delhi, or from Tokyo, from home. One must come from where one comes from; one must learn what it means to be human in the context of one's own personal life.

If you are lucky enough to have a mother who teaches you about peace while there are many wars, and also makes it possible for you to learn music, that is pure gain. But everyone in the world does not have that kind of mother and does not come from Catalonia under the circumstances of Casals. Therefore, what we must do if we are serious educators is to make those Catalonia situations (and I am not suggesting that we all become mother-substitutes) exist in the schools and colleges. This is what the teacher is—a person who teaches that in the world society of the 1970's what the world most needs is some positive, peaceful, socially just solutions to problems which can never be solved by the use of force, terror, and violence. If the universities do not take up that task, there is no other single institution in the world capable of doing what has to be done.

The United Nations University: An Intellectual Utopia or a Bureaucratic Morass?

Ward Morehouse

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Transnationalism and Scholarship

For many centuries, the universe of learning has conjured up the image of the wandering scholar whose unquenchable thirst for knowledge carries him to the four corners of the earth. This image has been romantically portrayed by the Pakistani physicist Abdus Salam, the Director of the International Centre for Theoretical Physics in Trieste, in a poignant comment on his own exodus from his native land in a similiar quest:

> Five Hundred Years Ago—around A.D. 1470—Saifud-din Salman, a young astronomer from Kandhar working at the celebrated observatory of Ulugh Beg at Samarkand, wrote an anguished letter to his father. In words more eloquent than I could employ, Salman recounted the dilemmas, the heartbreaks of an advanced research career in a poor, developing country:
>
> > Admonish me not, my beloved father, for forsaking you thus in your old age and sojourning here at Samakand. It is not that I covet the musk-

> melons and the grapes and the pomegranates of Samarkand; it is not the shades of the orchards on the banks of Zar-Afsham that keep me here. I love my native Kandhar and its tree-lined avenues even more and I pine to return. But forgive me, my exalted father, for my passion for knowledge. In Kandhar there are no scholars, no libraries, no quadrants, no astrolabes. My star-gazing excites nothing but ridicule and scorn. My countrymen care more for the glitter of the sword than for the quill of the scholar. In my own town I am a sad, a pathetic misfit . . . .
>
> Saif-ud-din Salman never did attain the greatness of his masters, Biruni, and Tusi, in astronomy. But this cry from his heart has an aptness of our times. For Samarkand of 1470, read Berkeley or Cambridge; for quandrants, we get the story of advanced scientific research and its dilemmas in the developing world of today as seen by those who feel in themselves that they could, given the opportunity, make a fundamental contribution to knowledge.[1]

In more recent times, the global dimensions of scholarship have not only persisted, but if the American experience is indicative of patterns elsewhere, have grown exponentially. Consider the following figures on the transnational contacts and interactions of U.S.-based students and faculty with the rest of the world during the post-war decades.

	1952-53	1957-58	1962-63	1967-68	1970-71
Foreign Students in the U.S.	34,000	43,000	65,000	110,315	144,708
Foreign Faculty and Scholars in the U.S.	600[a]	3,000[b]	6,000	11,641	12,047
U.S. Students Abroad	9,000	12,000[b]	16,072	21,600[d]	32,148[e]
U.S. Faculty Abroad	NA	1,200[c]	2,900	4,775	6,291

SOURCE: Institute of International Education, *Open Doors: Report on International Exchange*, New York: Institute of International Education, annual.

[a] Figure is for 1954-55, first year on which data were collected.

[b] Estimated.

[c] Figure is for 1955-56, first year on which data were collected.

[d] 1966-67

[e] 1969-70

To those committed to the ideal that pursuit and dissemination of knowledge should transcend the boundaries of individual nation-states, it would appear that at least in the rarefied atmosphere of academia, we should be well on our way to breaking down the barriers of nationalistic attachment which inhibit the free flow of ideas around the

globe. Alas, such is not the case.

While there are certainly many cases in which the transnational ideal of scholarship guides the behavior of individual scholars, it has left untouched many more inhabitants of academia and has only infrequently (and that too in relatively small and isolated institutions) come to dominate the collective behavior of academic institutions. On the contrary, the post-war decades in particular have been characterized by persisting evidence that universities, and the scholars who inhabit these institutions, are all too often, wittingly or unwittingly, instruments of national self-aggrandizement by those nation-states which sustain them. Project Camelot, the Himalayan Border Project, and other misadventures of American academics abroad come painfully to the mind of any American scholar concerned with strengthening the transnational dimensions of scholarship, although in my view the disparity in financial and other resources between scholars in rich countries like the United States and those in poor societies is an even more fundamental and pervasive problem than such explicitly mischievous capers.[2]

The Genesis of an International University under the United Nations

I mention these circumstances by way of underscoring what I consider to be the central importance of the effort to create an international university under the United Nations University—that is, an attempt to build a truly transnational structure for intellectual cooperation and scholarly work. The idea of a world university has, of course, been around for a long time. Organized efforts in Europe go back to at least the 1920's in seeking fulfillment of this longstanding aspiration of scholars everywhere. But the possibility of a world university under UN auspices really began to gather momentum in 1969 when the then Secretary-General of the United Nations, U Thant, seized hold of the idea. U Thant was able to give it the essential visibility which can come only from those who have access to the centers of political power and the global media of communication, an access that few scholars have.

The UN University proposal then began to wend its way through the elaborate, complex, and time-consuming decision-making process of the United Nations system, a history which is briefly told in Appendix I of this paper. For some time, the proposition appeared to flounder, possibly because it was not sharply enough focused to capture the attention of those men and women from the world of action who dominate the councils of the United Nations system.

But the idea of a UN University was rescued from becoming no more than a footnote to history by the creation of a Panel of Experts to consider the feasibility of an international university under UN auspices. The Panel of Experts strove for a definition of a UN University which would combine the ideas of transnationalism in scholarship with the political reality of securing the assent of a majority of member government of the United Nations. What emerged from the Panel of Experts was a proposal for a network of post-graduate research and training institutes throughout the world linked together by a "programming and coordination center." This conception of a "world university," while modest and sensible to some, was dismissed by others as too limited in scope and unimaginative in character to warrant their support. (Excerpts from the Panel of Experts report are given in Appendix 2.)

The issue finally came to a head in last year's General Assembly in New York where, in December, 1972, formal approval was given to the establishment of the United Nations University, notwithstanding the manifest lack of enthusiasm of a number of major powers, including the United States. We are, therefore, at a particularly timely and significant point in the history of transnational intellectual cooperation. Before our very eyes is occurring the creation of what has the *potential* to become the first truly transnational scholarly endeavor in the modern world, if not in all of human history.

A Founding Committee for the UN University has recently been designated, has just completed its first meeting in New York, and will soon be meeting again in Paris. (The membership for the Founding Committee is given in Appendix 3.) A number of critical tasks lie ahead, including the drafting of the constitution for the University, the raising of funds for its initiation, and perhaps most important of all, the identification of those individuals who will occupy key roles of leadership in the early stages of development of the institution (These steps are outlined in the statement by the current Secretary-General of the UN, Kurt Waldheim, to the first meeting of the Founding Committee in Appendix 4).

The Concept of the UN University

Perhaps the best articulation of the evolution of the idea of a UN University and the present concept governing its establishment is found in the opening statement by Secretary-General Waldheim to the Founding Committee at its meeting this March.

> A major evolution of the concept of the international university has taken place over the last few years. The original emphasis on the education of

> students in their formative years has moved to an emphasis on scholars—senior as well as junior—at the post-graduate level, with particular reference to research and training.
>
> The focus of the studies which would be undertaken by the United Nations University has also been narrowed to subjects of global importance requiring cooperation among scholars from different disciplines and various regions of the world. The new approach would be primarily action-oriented and multi-disciplinary, and an international community of scholars and trainees at an advanced level is expected to emerge, rather than the teacher-student relationship on the traditional university basis.
>
> In short, emphasis is now laid on actively encouraging and assisting existing universities and research institutions in their attempt to up-grade, universalize and innovate their programmes. Dissemination of knowledge, exchange of academic personnel and the generation of catalytic ideas, would constitute the central functions of the University.[3]

Secretary-General Waldheim has rightly stressed the changing conception of the UN University. He suggests that the UN University will become "an international community of scholars and trainees" rather than an institution based upon "the teacher-student relationship" of existing universities. If the distinction between "trainees" and "students" is a valid one, then the critics of the whole idea on the "left" (in an educational rather than political sense) argue that the UN University is not a university at all since a university without students is a contradiction in terms. My own view is that the distinction is not valid, that "trainees" are indeed "students," and that furthermore serious scholars remain students all their lives, continuing to advance their own learning as they seek to advance the frontiers of knowledge. So the UN University will indeed have students, although admittedly not students who are candidates for university degrees.

Critics on the right argue that the concept of the UN University which has finally emerged represents a political compromise rather than fulfillment of the lofty aspirations of transnational intellectual cooperation. They point to the not always very inspiring record of the existing research activities and institutes within the UN system and suggest that the UN University will soon become bureaucratized and sanitized, if not politicized. (The Panel of Experts has recommended that the UN University "could originally comprise the United Nations Institute for Training and Research (UNITAR) and probably several other existing institutes and centers of the United Nations system.") Such critics also argue that the relationship of the UN University to existing university institutions throughout the world is not at all clear, with the result that the UN University will simply end up duplicating, by implication at a lower level of quality, work which is being conducted in existing universities.

The question of whether the UN University will rapidly become bureaucratized, sanitized, and/or politicized is a serious one. Formal organizational arrangements will not in and of themselves prevent any of these possible characteristics from dominating the UN University, but such arrangements may increase the prospects for avoiding them or at least inhibiting their dominance. (It is well to recognize that all existing universities are in some measure bureaucratized, much university-based research, especially on sensitive social and political issues, is "sanitized" in some measure, and many universities are highly politicized.) The Panel of Experts has proposed what I believe is an unique organizational arrangement for the UN University, designed to guard against these three hazards. For unlike any other unit in the UN system, including the United Nations itself (all of which are organizations, the membership of which is composed of national governments), the UN University will be the creation of the United Nations itself. Whether this kind of "transnational" organizational status will be sufficient to assure intellectual autonomy for the UN University remains to be seen. In such circumstances, the proof of the pudding is always in the eating.

Like human institutions everywhere in the process of being born, the UN University carries with it many hopes and aspirations. Some of these are quite unrealistic and will never be achieved, others may be realized in part, and still others in substantial measure. In the last analysis, like any institution at the moment of birth, the significance of the UN University lies in its potential, and this potential is exciting indeed. As the UN Secretary-General expressed it so well in his statement to the Founding Committee, the UN University "could develop into a dynamic network of intellectual cooperation on a global scale and serve to bring a greater international dimension to research and higher education."[4]

Challenges Ahead: Financial, Political, and Academic

The challenges which lie in the way of the UN University's achieving that potential are substantial, and in some cases formidable, and the points raised by critics of the whole idea, whether from the right or from the left, should not be lightly dismissed. While the cost of the kind of modest initiative which the present concept of the UN University represents, is quite small, even in relation to the scale of other UN activities, let alone the work of major national governments, especially in the industrialized countries, the money must be raised through voluntary contributions. The Founding Committee is presumably addressing itself in greater detail to the initial financial requirements,

but the Panel of Experts has estimated that the annual recurring costs for the programming and coordinating center would be in the neighborhood of $1-2 million, with the cost of an average unit within the university system to be of about the same order of magnitude. This means that the UN University, if it were at the outset to include the programming and coordination center and ten units throughout the world, could be financed with about the same amount of money which the Nixon Administration is trying to eliminate from the U.S. Government budget for support of international studies in American colleges and universities. (I refer to the $15.3 million appropriation for language and area studies and world affairs in the U.S. Office of Education.)

Still, the money must come from somewhere, and of course, if the UN University is to begin to approach the kind of potential set forth by the Secretary General, it will need to move, over time, considerably beyond this very modest level of support. Money rarely comes without strings—if not ideological or political, then at least in terms of accountability. And if the money involved is public money, as it is likely to be, the strings are likely to be stronger. The UN University's best hope, in my view, is developing a multiplicity of sources of support, no single one of which, if it were to be withdrawn because of indignation over some controversial piece of policy-oriented reserach, would threaten the entire institution. Hopefully also the UN University will be able to develop a blend of public and private support, with the private support being generated from as wide a variety of sources throughout the world as possible (and *not* just major U.S.-based philanthropic foundations).

During the three year period when the UN University proposal wound its way through the maze of decision-making bodies in the UN system, a major bone of contention was over the method of financing the proposed university. In the resolution finally adopted by the General Assembly, provision is made for financing on an entirely voluntary basis. Given the financial difficulties of the UN system as a whole, this is probably sensible. It may be sensible for another reason because it helps to avoid domination of sources of support by the major powers which are the principal contributors to the UN's regular budget.

My own hope would be that a number of countries would be willing to come forward with commitments of modest but *long-term* support since continuity is vital to any university institution. Since the total amounts involved in the UN University, even in greatly expanded form, will not be large, less affluent countries can still play an active role. I also hope that the major powers will participate in support of the university on an equally modest basis, if only as an earnest of their desire to see the new institution achieve its potential, but I would not want any of the larger powers to contribute in proportion to national income,

for this would result in the UN University becoming too dependent on a few large sources of financial support.[5]

The financial challenge is closely related to the political challenge. Will it be possible for an institution created by the United Nations, which is in turn very much an instrumentality subservient to the interests of individual nation-states, to rise above those interests and serve the larger good and welfare of all men everywhere? Secretary General Waldheim has emphasized that the UN University will be involved in "action-oriented" research. Of necessity, this will involve critical examination of the public policies of national governments, at least if the UN University is to do research of any significance. Can the UN University attract individuals of such unquestioned intellectual and moral authority to its ranks that it will be able to resist the kinds of pressures which will almost certainly be generated by "action-oriented" research?

Will it be possible for the individual scholars and "trainees," no matter how dedicated to the ideals of transnationalism, to shed their national identities, as they enter the UN University, after having been conditioned all the preceding years of their life to think in terms of nation-states as the critical elements in relationships of all kinds which move beyond national political boundaries? Clearly there are some individuals sufficiently committed to the ideals of transnationalism to be able to rise above the confining limits of their national origin and identity. What kind of correlation there is between such individuals and those of the intellectual brilliance and scholarly stature which the UN University hopes to attract, and whether a "critical mass" can be assembled early in the game of persons combining these two qualities so as to assure the transnational character of the UN University in the years ahead, are the critical questions.

There are no easy answers to these questions. Time alone will tell. The pattern of financing will be one important variable. The organizational arrangements to which I have already referred are another. But the most important of all will be the caliber of the individuals who inhabit the university structure in its governing organs, programming and coordination center, and research and training units throughout the world.

This brings us to the question of tenure arrangements for the UN University. The Panel of Experts and the Secretary General both suggest that some pattern of limited tenure or rotation should characterize the appointment of faculty and fellows to the UN University, partly to avoid the UN University becoming a means of accelerating the "brain-drain" from the developing countries. This pattern has other advantages as well because it assures the continuing infusion of fresh blood and new ideas into the University and avoids some of the very real

problems of "biological aging" which afflict institutions of advanced training and research throughout the world.

But a rotational staffing pattern also has some disadvantages. The problems of "re-entry" will have to be squarely faced—that is, how individuals can re-enter their own national systems of higher education after a three or five or ten-year term in the UN University. If there is not, furthermore, some core of continuing intellectual participation in the work of the University, continuity in the academic work of the University will suffer. Research of any consequence on the kinds of intractable global problems confronting mankind which will constitute the agenda for the UN University will often be long-term in character. Even if it is supposed to be "action-oriented," such research will take in some cases many years to come up with validated answers to the really critical problems before the world in the second half of the twentieth century.

Also lying ahead is the challenging task of defining the program of work of the UN University. The Secretary-General has suggested that the focus of the UN University's work has been "narrowed to subjects of global importance." The UN Panel of Experts has gone a bit further in suggesting that these problems include "those of co-existence between differing cultures, tongues, and social systems, of peaceful relations between nations and the preservation of peace and security, of economic social change and development (particularly the problem of development in non-industrialized countries and regions), of environment and proper use of resources, and of the application of the result of science and technology in the interest of development."

But this formulation is still very broad, and of course, there is much work being done in universities throughout the world on questions of this kind. One of the critical tasks which lie ahead, therefore, is translating this kind of generalized statement of the UN University agenda into more specific, concrete terms which will reflect the distinctive character of the UN University approach to such issues so as to complement what is being done already in the universities of the world.

The UN University, Transnational Intellectual Cooperation, and Academics: The Need for Humility

That task will not be an easy one and will require active involvement of the best and most creative minds not only from the universities of the world but from other sectors of society as well. My own view is that the UN University will best be able to develop a distinctive character for its work to the degree that it is able to rise above the existing scholarship on global problems and emerge with a truly transnational approach to these issues.

This kind of orientation toward scholarship in any major field of knowledge is perhaps the greatest challenge presented by the UN University. While academics may pay lip service to the "universal" character of their scholarship, the melancholy fact is that much of what has been done in recent years, at least in the social sciences and humanities, suffers from a "Western" bias. Gradually this bias is beginning to be recognized, but the recognition comes slowly and established ways of thinking are not easily changed.

One of the sharpest and most perceptive critics of the conceptual and methodological bias in social science scholarship, particularly that carried on in rich countries regarding poor countries, is Gunnar Myrdal. In *An Asian Drama, The Challenge of World Poverty* and other works, Myrdal has argued that many of the basic assumptions and categories used by scholars in his own discipline of economics are derived from analysis of economic behavior and institutions in Western societies and then are applied by Western social scientists (and by social scientists from the Third World who have been trained in the West) to poor societies where such assumptions are at best irrelevant and at worst plain wrong. The same can be said of much recent scholarship in the other social sciences as well, notwithstanding the claims of universality made by scholars on behalf of their work. The task of the UN University as a transnational institution will be to move beyond such bias, whether of East or West, North or South, rich or poor, toward true universality.

While this represents the UN University's greatest challenge, it also constitutes its greatest potential impact on the world of learning. "The emphasis is now laid on," Secretary-General Waldheim has said, "actively encouraging and assisting existing universities and research institutions in their attempt to upgrade, *universalize* and innovate their programmes."[6] If indeed this does happen, the modest initiative which the UN University represents and the modest investment of resources which it is likely to command will have a return far, far greater than what will have been put into it. In the last analysis, the greatest significance of the UN University lies in the potential it represents for strengthening the "transnational" dimension of the work of existing academic institutions throughout the world.

In this kind of enterprise there is a continuing temptation for those who think of themselves as committed to the goals of such a noble adventure as the UN University as having a superior moral, if not intellectual, stature and of therefore being better able to confront the really critical problems confronting all men everywhere in the remaining decades of this century, not to mention the new millennium which twenty-seven years from now will be upon us. Humility, a becoming virtue in many cultures of the world, is a critically important quality for

such individuals. Wendell Berry has expressed the idea more eloquently than I can in these words:

> We have lived by the assumption that what was good for us would be good for the world. And this has been based on the even flimsier assumption that we could know with any certainty what was good even for us. We have fulfilled the danger of this by making our personal pride and greed the standard of our behavior toward the world. . . .
>
> We have been wrong. We must change our lives, so that it will be possible to live by contrary assemption that what is good for the world will be good for us. . . .[7]

Notes

1. Abdus Salam, "Advanced Scientific Research in Developing Countries," in Ward Morehouse, ed., *Science and the Human Condition in India and Pakistan,* New York: Rockefeller University Press, 1968, p. 88.

2. I have explored some of these issues in "Social Responsibility, International Scholarship, and Public Policy in a Transnational World" (Paper prepared for First Vienna Rotating Seminar on "The Role of the University in the Quest for Peace," University of Vienna, July 24-28, 1972).

3. Kurt Waldheim, "Statement by Secretary-General at First Session of Founding Committee of United Nations University," New York: United Nations, 27 March 1973.

4. Ibid.

5. The reported action of the U.S. government in refusing to contribute at all to the UN University in its initial stages is indicative of the negative attitude taken by the major Western powers and the Soviet Union on the UN University. For a critique of U.S. Policy toward the UN University, see Harold Taylor, "The World as an Open University," *Change,* May, 1972; ibid. "UN Halls of Ivy," *New York Times,* November 15, 1972; ibid. "A Case of Global Myopia," *World,* December 19, 1972; and a point-by-point analysis of the U.S. arguments against the UN University by Harold Taylor and myself in a memorandum widely circulated in the U.S. academic community, "Another Chance to Save the World—Changing the Present U.S. Policy on the Proposed UN University," October 3, 1972.

6. Waldheim, op. cit. Emphasis supplied.

7. Wendell Berry, *The Long-Legged House,* New York: Audubon Society and Ballantine Books, 1971, p. 196.

Appendix I. Brief Legislative History of the United Nations University: 1969-1972

The idea for the creation of an international university was put forward by U Thant, then Secretary-General of the United Nations, in September 1969 in the introduction to his annual report on the work of the organization. He suggested that serious thought be given to the establishment of "a United Nations university, truly international in character and devoted to the Charter's objective of peace and progress." He said that the university might be staffed with professors coming from many countries and might include in its student body young men and women from many nations and cultures. The primary objective would be to promote international understanding both at the political and cultural levels. Working and living together in an international atmosphere, the students in their formative years would be able to break down the barriers between nations and cultures. U Thant added that the university should be located in a country noted for its spirit of tolerance and freedom of thought.

The General Assembly in 1969 unanimously adopted a resolution, in which it welcomed the initiative of the Secretary-General. The Assembly invited him to undertake a feasibility study which would include a clear definition of the objectives of an international university and recommendations as to how it might be organized and financed.

After preliminary consideration of the report (E/4878) prepared by Mr. Arthur Lall, the Economic and Social Council pointed to the need for further studies, and invited UNESCO, UNITAR and other interested agencies of the United Nations to provide the Council with recommendations as to how such a university might be organized and financed.

During its twenty-fifth session in 1970 the General Assembly called for further studies of the question. It suggested that UNESCO study the educational, financial and organizational aspects of the question. The Secretary-General was asked to continue his consultations and studies relating to the problems primarily of concern to the United Nations. The views and proposals of Governments were solicited. The Assembly authorized the Secretary-General to set up the Panel of Experts of fifteen members. The Panel of Experts produced one interim report and two reports (A/8510 and E/5155) in 1971 and 1972. Studies conducted by UNESCO experts and the results of a widely distributed questionnnaire were summarized in a report by the UNESCO Director-General (88 EX/6). UNITAR also made recommendations on the subject (A/8510).

The twenty-sixth Assembly in 1971 took note of the report of the Secretary-General containing various studies, and asked him to continue his studies in consultation with UNESCO and other interested bodies. The Panel of Experts was now expanded with the addition of five more experts.

In June 1972 the UNESCO Executive Board adopted a decision reaffirming its previous decision to commend the proposal to establish an international university under the auspices of the United Nations. The Board expressed agreement with the conclusion reached by the experts that it was both desir-

able and opportune to establish such a university. It endorsed a number of principles such as academic freedom and a decentralized approach. In October the Economic and Social Council adopted a resolution endorsing the views and recommendations of the Secretary-General and recommending that the Assembly make a decision on the establishment of an international university at its twenty-seventh session. The Council also recommended that the Assembly take practical steps for implementation as soon as possible, including the creation of a Founding Committee.

The UNESCO General Conference met in November 1972 and endorsed the decision by its Executive Board in the matter. It also recommended that the United Nations General Assembly at its twenty-seventh session to make a decision to establish an international university under the auspices of the United Nations.

On 11 December 1972 the General Assembly adopted a major resolution by 101 votes in favour, eight against with four abstentions, deciding to establish the United Nations University in accordance with a set of objectives and principles recommended by the United Nations Panel of Experts and the UNESCO bodies. A Founding Committee of twenty members was recommended to undertake the drafting of the Charter. The Assembly asked the Secretary-General to engage in fund-raising activities and to make recommendations to the 1973 General Assembly on the location of initial elements of the United Nations University, which was to be composed of a decentralized network of advanced institutions of research and training on urgent global questions, centering around a programming and co-ordinating central organ. Assuming that the next Assembly will adopt the Charter and approves the Secretary-General's report on preparatory steps, the initial operations of the United Nations University may be expected to begin in the course of 1974.

SOURCE: Committee for the Promotion of an International University in America, Inc., Conference on the United Nations University and other World Colleges and Universities, New York, April 2, 1973.

Appendix II. Report of the United Nations Panel of Experts on the Establishment of an International University on Its Third Session, 5-8 April 1972, UNESCO House, Paris. Excerpts.

The Desirability of Establishing a United Nations University

3. Having carefully re-examined the proposals outlined in its own previous reports and in UNESCO's feasibility study as well as in the reports prepared by UNITAR, the Panel reaffirms its unanimous conviction that the establishment of a United Nations University would be highly desirable. Such a university should indeed prove to be of great importance and value to the world community. . . .

4. Consequently, the Panel considers that there are at least two main groups of functions which make the creation of an International University highly desirable:

(a) the function of promoting and undertaking research work and the training of highly qualified researchers who will be concerned with problems which demand the cooperation of specialists in several disciplines, a training and research work of a continued nature which would contribute to improving or ensuring the conditions of existence of mankind. This concerns problems such as those of coexistence between differing cultures, tongues and social systems, of peaceful relations between countries and the preservation of peace and security, of economic and social change and development (particularly the problem of development in non-industrialized countries and regions), of environment and proper use of resources, and of the application of the results of science and technology in the interests of development. . . .

(b) to assure the contact of scientists from countries at different stages of development, to permit all concerned to study the existing problems of certain disciplines and to generally enrich their knowledge. The University should certainly concern itself in this direction as well, profiting from the experience and success of the International Centre for Theoretical Physics of Trieste in the field of pure science.

5. In addition to these two primary functions, which are complementary, the University would stimulate the efforts of the universities and other institutions of higher learning of the entire world towards the realization of the principles of the Charter of the United Nations. . . .

Organization

7. While the proposed United Nations University offers great possibilities of expansion, it must inevitably begin modestly, developing a network of research and training centres, existing and to be established. It could originally comprise the United Nations Institute for Training and Research (UNITAR) and probably several other existing institutes and centres of the United Nations system. . . .

8. The core of the network of institutions forming the University, directly under the Rector of the University, would be its Centre for Programming and Co-ordination. The network itself would comprise, in addition to existing bodies, others that would be developed, in accordance with needs and as funds become available, taking into account academic and geographical criteria and the necessity for mutual coherence. The research centres would be linked among themselves and to the Programming Centre in such a way as to permit effective co-ordination and interaction, as well as to foster initiative, creativity and innovation. . . .

10. The University should assume and maintain the character of an academic and scientific institution, integrated in the world academic community, and not that of an intergovernmental organization. It would not engage in undergraduate study but would concentrate on research and training at the postgraduate level. . . .

Financial Aspects

16. The Panel feels that it is not realistic to expect that the project could be even partly financed in the near future from the regular budget of the United Nations or of any of the specialized agencies. However, some assistance by the United Nations and/or by its agencies would be desirable in order to mark the international character of the University. Little doubt can be entertained that the bulk of the budget of the University system would have to come from voluntary contributions. Possible sources of such voluntary financing are:

(a) Governments of States Members of the United Nations or members of specialized agencies;

(b) Intergovernmental organizations, including the specialized agencies and programmes;

(c) Non-governmental organizations, including foundations and universities, and individuals. . . .

The Guarantee of Academic Freedom

23. The Panel examined the operational methods and principles of the University and in particular the independence and academic freedom of its members. The Panel is unanimous in considering that the University should be devoted exclusively to the study of problems that figure in its programme and to the training of research workers. Consequently, it would not be subjected to any political pressure or any other influence which would entail a deviation from scientific research undertaken in an objective spirit. . . .

26. On the whole, academic freedom within the United Nations University will largely depend on the wisdom and care with which the work of the University and of each of its units is conducted and also on the determination of each of the University's individual members to preserve such freedom. . . .

SOURCE: United Nations, Economic and Social Council, *Question of the Establishment of an International University: Report of the Secretary-General* (transmitting the report of the Panel of Experts), New York: United Nations, May 17, 1972 (E/5155, Fifty-third Session, Agenda Item 15).

Appendix III. Founding Committee of the United Nations University

Andrew W. Cordier, *Chairman* (United States). Former Dean, Graduate School of International Affairs, Columbia University; former President, Columbia University; Under-Secretary, United Nations Secretariat, 1946-1961.

G. Parthasarathi, *Vice-Chairman* (India). Vice-Chancellor, Jawaharlal Nehru University; Member, UNESCO Executive Board; Member, Board of Trustees, UNITAR; Permanent Representative of India to the United Nations, 1965-1968.

Senjin Tsuruoka, *Vice-Chairman* (Japan). Member, International Law Commission; Permanent Representative of Japan to the United Nations, 1967-1971; Lecturer in International Law, University of Tokyo, 1949-1955.

Victor Sahini, *Rapporteur* (Romania). Vice-President, University of Bucharest; Professor of Physical Chemistry; Correspondent Member, Romanian Academy and Representative of the Romanian Academy at the International Council of Scientific Unions.

Roberto T. Alemann (Argentina). Chairman of the Board, Ciba-Geigy, Argentina; Professor of Economics, University of Buenos Aires; Ambassador to the United States, 1962-1963; Ministry of Economy, 1961.

Sune Bergstroem (Sweden). Director, Karolinska Institute, Stockholm; Member, Royal Swedish Academy of Engineering Sciences and Royal Swedish Academy of Sciences.

Borislav Bozovic (Yugoslavia). Dean, Faculty of Medicine, University of Belgrade.

Roger Gaudry (Canada). Rector, University of Montreal; Director of Research, Ayerst Research Laboratories, 1957-1965.

Felipe Herrera (Chile). Professor of Economics, University of Chile; Member, Board of Trustees, UNITAR; former President, Inter-American Development Bank; Minister of Finance, 1953.

Abdel R. Kaddoura (Syria). Professor of Physics, Universities of Damascus and Oxford; Member, UNESCO International Commission on Educational Development.

Y. K. Lule (Uganda). Secretary-General, Association of African Universities; former Minister of Education; former Vice-Chancellor, Makerere University, Kampala.

Robert Mallet (France). Rector, Academy of Paris; Chancellor of the Universities of Paris; Rector, Academy d'Amiens, 1964; former Dean, Faculty of Letters, Madagascar.

M. Seydour Madani Sy (Senegal). Rector, University of Dakar; former Dean, Faculty of Law and Economic Science.

Ahmed E. A. Meguid (Egypt). Permanent Representative of Egypt to the United Nations; former Minister of State for Cabinet Affairs; former Head of the Cultural and Technical Assistance Department, Foreign Ministry; former Professor of International Law at the Universities of Cairo and Alexandria.

V. A. Oyenuga (Nigeria). Vice-Chancellor, University of Ibadan; President, Association for the Advancement of Agricultural Sciences in Africa; Member, National Agricultural Advisory Committee.

Sir Hugh N. Robson (United Kingdom). Chairman, Committee of Vice-Chancellors of the United Kingdom; Vice Chancellor, University of Sheffield; former Chairman, Central Committee on Postgraduate Medical Education, Great Britain.

Abdus Salam (Pakistan). Director, International Centre for Theoretical Physics, Trieste; Member, United Nations Advisory Committee on Application of Science and Technology to Development; former Chief Scientific Adviser to the President of Pakistan.

Pauy Ungpakorn (Thailand). Professor of Economics, Cambridge University; former Dean, Faculty of Social Sciences, Chulalongkorn University; former Dean, Faculty of Economics, Thammasat University, concurrently serving as Governor of the Bank of Thailand.

Victor L. Urquidi (Mexico). Director, Colegio de Mexico; Member, United Nations Advisory Committee on the Application of Science and Technology to Development.

Stephen Verosta (Austria). Professor of International Law, Jurisprudence and International Relations, University of Vienna; Ambassador to Poland, 1956-1961; Head of Legal Department, Foreign Ministry, 1953-1956.

SOURCE: United Nations Office of Public Information, Press Release SG/A/135/UNU/6, February 22, 1973.

Appendix IV. The Concept of the UN University: Statement by Secretary-General Kurt Waldheim at First Session of Founding Committee of United Nations University

It is a great pleasure for me to open the first session of the Founding Committee of the United Nations University. I am very grateful to you for the time which you have agreed to give to this task, and I welcome you most warmly.

I am sure that the Committee would wish me to take particular notice of the presence of Dr. Andrew Cordier. His involvement with the United Nations since its inception, as a senior member of the Secretariat, as an educator, and as an eminent scholar, has been of the greatest value to the organization, and we are all delighted to see him here today.

As you know, the General Assembly Resolution gave this Committee the task of defining further "the objectives and principles of the United Nations University and to draft its Charter". Its membership was to be designated by the Secretary-General of the United Nations and the Director-General of UNESCO, in consultation with the specialized agencies and programmes concerned, including UNITAR.

The passing of Resolution 2951 (XXVII) was a major step in the work of establishing the United Nations University, and there are three important actions which will be taken this year to implement the decision of the General Assembly.

First, a draft Charter has to be prepared by this Committee, which will subsequently be sent to the Economic and Social Council and the Executive Board of UNESCO for any comments and observations which they consider might be of value to the Assembly.

Secondly, I have been asked by the Assembly to commence efforts for raising the necessary funds in order to permit the launching of the University "at the earliest possible date." On January 31st I wrote to all Member Governments of the United Nations asking them to let me know the extent to which they are willing to make financial contributions and other commitments towards the projects to be sponsored by the University. It is hoped that some governments and non-governmental organizations will be able to assist units which might be created outside their countries, particularly in the developing countries. I hope that the attitude of most of the interested Governments will be known by the end of May.

Thirdly, the Assembly asked me to make recommendations concerning the location of the programming and co-ordinating centre and of the other institutions in the United Nations University network in consultation with the Director-General of UNESCO and the Executive Director of UNITAR. The views of your Committee on this matter, and the offers of facilities and other types of contribution, will be taken into account in formulating my recommendations to the Assembly.

Since the idea for the creation of an international university was put forward by my distinguished predecessor, U Thant, in September 1969 in the Introduction to his Annual Report on the work of the Organization, the pro-

posal was considered extensively by legislative organs of the United Nations and UNESCO for three years before the final decision was taken last year.

The General Assembly in 1969 welcomed the initiative by the Secretary-General and invited him to undertake a feasibility study. However, further studies of the question were considered necessary in the following session of the Assembly, which established a Panel of Experts on which some of you served so ably. A similar request for continued studies was made by the Assembly in 1971. The question was again debated last year in the Economic and Social Council as well as in the Assembly. UNESCO was also seized of the question over the years and its General Conference last year endorsed a number of principles regarding the University.

A number of experts and consultants from many different regions of the world, representing various fields of study, participated in the elaboration of the proposal and the clarification of issues raised in various intergovernmental organs. The Panel of Experts, established in 1970 and expanded in the following year, made a most significant contribution to this process. Its last report reflected a careful balance between divergent requirements for the University. The studies conducted by UNESCO and UNITAR were also of great value.

A major evolution of the concept of the international university has taken place over the last few years. The original emphasis on the education of students in their formative years has moved to an emphasis on scholars—senior as well as junior—at the post-graduate level, with particular reference to research and training.

The focus of the studies which would be undertaken by the United Nations University has also been narrowed to subjects of global importance requiring co-operation among scholars from different disciplines and various regions of the world. The new approach would be primarily action-oriented and multi-disciplinary, and an international community of scholars and trainees at an advanced level is expected to emerge, rather than the teacher-student relationship on the traditional university basis.

In short, emphasis is now laid on actively encouraging and assisting existing universities and research institutions in their attempts to up-grade, universalize and innovate their programmes. Dissemination of knowledge, exchange of academic personnel, and the generation of catalytic ideas, would constitute the central functions of the University.

SOURCE: United Nations Office of Public Information, Press Release 5G/SM/1834/UNU/7, March 27, 1973.

Discussion Report: Staffing of the United Nations University

Howard L. Gauthier

Professor of Geography
The Ohio State University

In discussing the multitude of issues arising from the complexities of staffing the UN University, the discussion groups agreed to the following set of guidelines.

1. There must be every effort made to minimize the gap between ideals and reality. High expectations, not based on understanding of political and economic constraints, will lead to disenchantment with the performance of the University.

2. In developing a program that is action oriented, proponents of the University are ignoring the fact that most scholars are science oriented. Failure to recognize this difference will restrict program development that is attractive to leading scholars.

3. Every effort should be made to involve scholars in the planning phases of the University. Academics are accustomed to setting their own agenda and not having it set for them.

4. In establishing the locations for the university, it is imperative to realize that scholars locate where there are critical masses of research resources and intellectual capital.

5. The preceding reality poses a conflict with a basic concern of the University. The problems to be dealt with by the University are concentrated in the less affluent nations, whereas the research and intellectual resources are concentrated in the more affluent nations.

To succeed the University must develop programs that contribute to the solution of major economic and social problems that beset mankind. The practical goals of the University must direct the programs that evolve from scholarly activity. Yet, programs and staffing are not divisible. The success of the programs is tied to the quality of the faculty attracted to the University.

Because of this indivisibility of programs and staff, several serious problems arise.

1. Most of the action-oriented studies that are done by international agencies are not perceived by the academic community to be of high quality. The University, in its action-oriented efforts, will face this image problem and have difficulty attracting top quality personnel.

2. To arrive at policy guidelines and program strategies, it will be necessary for the staff to deal with narrowly defined, highly specified problems. Such mission-oriented research requires a heavy commitment to multi-disciplinary staffing. This orientation will be subject to the numerous limitations and weaknesses associated with inter-disciplinary research in universities. Not only will this deepen the image problem for the University, it will reduce the attractiveness of involvement by leading scholars who will face a re-entry problem on returning to their home institutions. This will be particularly acute with American scholars who will be faced with the realities of low professional recognition and no monetary reward for such types of cooperative research.

3. The staff that is attracted to the University will be faced with conflicting pressures on the type of research they will pursue. The sponsoring agencies, of necessity, will be exerting force favorable to the development of mission-oriented research. They will discourage research that is not relevant to the constituent agencies of the United Nations. As a counter force, there will exist the pressures from the academic communities to pursue research that is academically respectable, even if it has limited relevance to the problems facing UN agencies. This conflict could easily paralyze the University and reduce its effectiveness to both the United Nations and the academic community.

4. Because mission-oriented research will be needed in areas of inquiry relative to societal problems, it will be difficult to escape political influences in problem definition, program research and policy conclusions. Successful research programs occur where political differences can be minimized. Where political ideology is strongly involved, objectivity is weakened. The attractiveness of the University to scientists is accordingly lessened.

While the discussion group recognized no simple solutions exist to the preceeding problems, it did recommend consideration of the following recommendations.

1. The UN University should *not* attempt to establish an independent research facility nor seek a resident professional staff.

2. The University should be a vehicle for promoting the development of task forces doing specific research using the facilities and staff of existing universities throughout the world. The development of a new set of universities as currently proposed by the United Nations is both undesirable and unfeasible.

3. There is no need to establish a UN University to serve as the generator of information on societal problems. Adequate means for generating such information already exist. There is no need to duplicate existing facilities. Rather, the UN University should explore the possibility of contract arrangements with existing institutes and universities.

4. The staffing problem is best met by establishing linkages with existing programs and permitting the research staff to remain with the contracting institute or university. By permitting staff members to remain with their home institutions, the serious re-entry problems will be eliminated.

The members of the discussion group recognized that their identification of problem areas in staffing and their proposed recommendations indicated a generally negative view of the concept of a UN University. This negative view highlights the seriousness of the staffing issue facing the United Nations. The absence of any significant enthusiasm among a group of scholars, who might be expected to be supportive of the effort to create a UN University, suggests that association with the University will even be less attractive to the majority of scholars who are less sympathetic to the idea of a UN University. It clearly suggests that the proponents of the University need to make a more effective effort in explaining and justifying the need for it.

Discussion Report: Programs of the United Nations University

Frederic J. Cadora

Director of the Middle Eastern Program
The Ohio State University

The discussants were very eager to take advantage of the presence of Dr. Morehouse in this discussion session and consequently followed essentially a question and answer format which raised several problems related to the challenges effected by the implementation of a United Nations University concept.

1. Mode of financing and location of the university are of great concern as they engender problems of domination by large contributors and host countries. The Secretary-General could alleviate this problem by channeling and seeking contributions without any strings attached from individuals, philanthropic organizations, and countries of diverse politico-economic systems. The character of the university should be decentralized across transnational lines; i.e., with constituent parts found in various countries.

2. Communication among scholars is a serious problem: this is not so much lingusitic as it is terminological. An information center may be established to facilitate the standardization of a vehicle of communication.

3. The overall approach of the university should be more than action-oriented. Practical applicability, whether short or long range, should not militate against quality research. Inevitable emphasis on creative research will engender meaningful teaching experience.

4. To attract distinguished scholars to this university in its formative period is difficult. This depends on the idealism of individual scholars. Junior scholars, however, may be invited to take part in teaching and/or research so that they may make a significant contribution to their home institutions upon their return.

5. No agreement as to what constitutes global problems has been arrived at. A planning committee may be formed to identify certain global issues that go beyond socio-economic problems, by invoking criteria: (a) to assess the crucial status of these issues and (b) to determine potential dividends from researching these issues. Emphasis should not be on the physical sciences—problems of disease, nutrition and pollution. The humanities should not be neglected; for example, more effective ways to teach foreign languages may be considered.

In retrospect, there was general agreement among the discussants that the United Nations University's activities must be concentrated on research and training in relation to problems which affect mankind as a whole. A modest beginning with several specific but crucial problems to be researched and solved by a network of small institutes would probably be the most successful approach in a formative stage. Such an approach would contribute to an evolving definition of this type of university concept and would facilitate a more realistic development towards the building of a coherent program.

Discussion Report: Students and the United Nations University

Ivan C. Rutledge

Professor of Law
The Ohio State University

The discussion in Professor Babcock's group turned first to the problem of recruitment of trainees in terms of the conflict between high standards and the concentration of the best prospects in some twenty universities, and the responsibility of the institution to all of the countries. The closely related problem of individual careers and how the institution might avoid becoming an instrument of "brain drain," reinforcing the disparity of university resources, was seen as part of the general question of specifying the goals of the institution as a preliminary to investigating techniques that might serve those goals.

Both problems were visualized as less accentuated in the natural sciences, where difficulties of language and variant perspectives on value are not so conspicuous as in the social sciences and humanities. There was some indication that in the humanities difficulties of language may be more challenging than in the social sciences, while the converse might obtain with respect to perspective, which could be more troublesome than language in the social sciences. As a first pass at these concerns, the thought was expressed that the activities of the institution might be cast in problem-oriented projects, enlisting the talents of multi-disciplinary combinations. And, this in turn might argue for more senior trainees who are prepared to transcend the discipline of their special fields. Also it was pointed out that the standards for selection might be designed to find trainees who may lack distinction

in terms of their specific discipline but are motivated towards a high degree of devotion to the tasks inherent in the treatment of a problem-oriented project.

Two ideas supplementing the foregoing were introduced: the desirability of a journal to make visible and subject to evaluation the trainee contributions; and the utilization of existing "think-tank" resources in forwarding the program.

Among the goals of the institution, some recommended that first priority should go to the achievement of a world-wide standard for existing universities.

The second main point that was stressed is the desirability of remaining attuned to such existing world culture as there is. It was thought that this approach indicates primacy in the goals of the institution for social and humanitarian concerns. The social sciences and humanities, however, should not on that account be accorded precedence over the natural sciences. That is, rather than emphasize the contemplative, the goals should stress the prudential skills of perceiving, attacking, and solving a problem.

Finally, the mission should not be conceived primarily in terms of research. Its structure should be built on centers of problem-solving, with the coordination of multi-disciplinary efforts in ways not yet clearly perceived.

Transnational and Transcultural Emphasis in University Curricula Development

Richard C. Snyder

Former President of the International Studies Association, Dr. Snyder is Professor of Education and Public Policy and Director of the Mershon Center at The Ohio State University. The following remarks, taken from transcript, are a summary of his speech.

Introduction

It's a privilege to be with you and I am delighted that the introduction was mercifully short. Instead of giving a formal lecture, I would like to take this opportunity to share some thoughts and questions with you on the assumption that all of us are engaged in an educational enterprise that now is world-wide in scope and impact, and perhaps constitutes the beginnings of one kind of world-wide community.

The topic assigned, "Transnational and Transcultural Emphasis in University Curricular Development," was calculated to give me wide latitude. What I would like to do is to stay within what I understand to be the broad implications of this topic, but not yield to one of several temptations. I doubt very much that the kinds of concerns which a group like this might share really come down in the last analysis to "curriculum" per se. I also doubt that any major reforms of what are typically called "courses" or programs of study would be anywhere near sufficient for us to meet the common challenges which seem to me to lie before us.

I suppose anybody in any branch of education these days feels lonely on many occasions, feels inadequate to the tasks that typically befall us, whether we define ourselves as teachers or researchers or some-

thing else. It's almost as though at this particular time the very overwhelmingness of problems and developments in knowledge or information almost reduces us to paralysis. On the other hand, there may never have been a time in recent years when there were so many opportunities if we could but stand back and ask ourselves some questions and then, in our minds and in our conversations with each other, move back and forth between some very ordinary things which we might do and some rather more venturesome things. There is an old saying that an optimist is a man who will eat wormy nuts in the dark and a pessimist is one who has. I would suppose that many educators probably do in the end become optimists who have eaten wormy nuts in the dark and who will continue to do so.

I assume that the four groups into which you will convene this afternoon will stimulate communication across disciplinary and national boundaries. I will not try to anticipate what might occur in these discussions, nor will I try to provide an overarching framework for them. However, I would like to comment briefly on each topic.

Comment on Four Discussion Groups

Relevance and Future of Area Studies Programs. I think there is under way in the United States—and I would hope that the same thing might be happening abroad with the possibility of convergence—a discernable trend away from some of the rather narrowly specialized concerns that have often typified language and area programs in the past. These "pieces of curricular real-estate," these domains of scholarship, now appear to have fluid boundaries. Indeed, a movement has started in this country on the part of large professional associations to reexamine priorities and to build bridges across the different sectors. A funding crisis has forced some hard thinking about what's going on, but I am sure that there are good intellectual reasons why people within the major area studies groups are beginning to ask questions about their relationship to each other as well as to a larger field that may be called International Relations or Intercultural Relations. This is a healthy trend which coincides with increased permeability, *hopefully,* of other kinds of boundaries, including national ones. It has always seemed to me rather strange that somehow in the evolution of these organized intellectual activities, certainly in the United States, we seldom ask whether despite the advantages of drawing a boundary around an area of inquiry or a place on the earth study, such territory could not be an all-purpose focus for *general* education rather than just for the training of experts (which is necessary) or to provide a more focused introduction to a larger subject, say, language or history. Any bounded "area" on the globe can be a microcosm within which to study the

whole human condition. William James once gave some lectures in Boston. Giant that he was, he could do something I think the rest of us ought to do more often, that is, speak a rather simple language to people who are not specialists in one's own field. As a matter of fact, *Talks to Teachers* is a set of public lectures devoted to vocational education and addressed to the public and the teacher. But he made an interesting comment in discussing children and their persistent tendency to collect things; why not have them collect something useful? Why would it not be useful for us to think of any young person "adopting" a strange society and focusing on that as a disciplined intellectual hobby, an object of study over a long period of time? The noncurricular pursuit of a natural interest might produce some degree of expertise in the process. In any case, I would hope that the Area Studies group might raise the question of whether we might turn area studies upside down and view them in a different way.

Environmental Pollution Problems. Such problems clearly have highly technical dimensions, but they may also provide additional incentives for the evolution and testing of global institutions, including those concerned with education. A concerted attack not only requires cooperative research, but much more attention than we have hitherto paid to transnational structures and processes which will perform certain functions. For example, how can the attention of "publics" within and among different societies be mobilized and focused so that alternative solutions and their consequences (costs and benefits) are understood and evaluated? This should include clarification of conflicts within and between constituencies. Whose definition of a problem will be authoritative, and how can proposals be placed on the agenda of an organization with power to act? Or, assuming that some kind of intellectual control over a given problem is possible, how does one move an "analytic" solution to the political realm without either loss of technical integrity or compromise of projected outcomes? To raise these types of questions is not to enter a plea for discouraging realism, but rather to suggest it might be appropriate for the members of this conference to use pollution problems as a lever for engaging larger issues to which university-based resources might contribute.

Peace Studies. When we come to university studies aimed at the achievement or preservation of world peace, I must say I become somewhat nostalgic. About a dozen years ago, at least in the United States, we put on a campaign to make peace a respectable, intellectually strong area of teaching and research. Indeed, I have memories of a small road show consisting of two comedians and a straight man, the two comedians being Harold Taylor and Ken Boulding and myself the

straight man. We went up and down the United States in 1959 talking to faculty and students about the significance of peace studies and the role they might play in higher education. We were not successful in launching anything like a "movement," so I am delighted that we are having what is obviously a large-scale revival of this transdisciplinary focus of attention on the part of students, faculty and the general public. With the impetus coming as it does in part from observed events, and in part from voices of concern largely expressed outside the university, the question is whether we can organize the university's resources so that the sum total of relevant competencies can be brought to bear. An external stimulus of this kind is healthy because it presents alternative incentives for the configuration of intellectual capabilities.

Modern Communications Media. This topic, too, has a familiar ring, bringing to mind phrases like "information systems," "data banks," "computerized learning processes," "video tapes," and so on. However, there are two perspectives which might push this topic beyond its obviously technical aspects, and thus give us another basis for discourse about common problems in different social and cultural milieus. One communication challenge arises from diverse modes of thought and expression, different ways of knowing, within multi-cultural societies, but attendant problems appear in interactions between societies. We might consider the possibility that with creative use of certain modern technological developments, we can discover some noncognitive ways of communicating with each other and indeed communicating abstract ideas and relationships without having to go through the laborious business of translating or providing carefully controlled behavioral settings. In other words, we may have within our grasp a way to depoliticize language. The possibility is intriguing enough that I would hope that there are activities on your own campuses and on this campus that might be observed in this light.

Another line of inquiry suggests that the present repertoire of technological capabilities might enable us to provide human beings within societies and across societies with a visual representation of their environments—again so that men do not have to rely solely on carrying pictures or abstractions in their heads, or rely only on the hectic, fragmented, and discontinuous portrayals of the mass media. Environments might be presented simultaneously and visually to a wide audience without some of the difficulties that we run into when we rely solely on verbal and written communications or on fabricated events presented as "reality."

These brief comments are simply a shorthand way of urging you to take advantage of an all too rare opportunity not only to share experiences, but perhaps to open up new perspectives which might help to

reorganize those experiences. There is a natural human tendency, supported strongly by culture and social organization, to build a world consisting primarily of artifacts called "words" and sets of "words." When repeated often enough, these tend to take on a reality of their own, and to become another box or category or way of bounding our thoughts and our activities. These four topics could become cutting edges if one looks behind or beyond the words themselves.

Toward a Common Agenda

Rather than discuss the consequences which arise from the fact that universities are organized generally by disciplines, or at least by areas of specialized study which do not seem to fit the world's problems, I would like to raise a question with you as fellow educators, in the broadest sense of that term. The context of the question is the interesting combination of change and resistance to change, of hope and despair, of great complexity and heroic simplification which seems to mark this period of history. I happen to be a Renaissance buff. That period is an intellectual hobby of mine, though I am, of course, not an expert. Certain developments from roughly the middle of the fifteenth century in Italy to the middle of the seventeenth century in Italy and a movement or set of forces that goes from Italy northwest across Europe provide an interesting backdrop for some of the concerns that we now have and produced some of the things going on around us now. The Renasisance was marked, it appears to me, by polycentrism, by violence, by the permeability of boundaries, by a kind of social anarchy from which emerged some remarkable things including, among many others, of course, an important piece of as yet unfinished business called the Enlightenment. The notion of Universal Man also emerged, but it was not an impractical ideal beyond the reach of ordinary men. A moment's realistic reflection may lead us to say, "Yes, of course, to be a Renaissance man in that day and age was quite different from, and easier than, being a Renaissance man in this day and age." I am not so sure. That was a time of turbulence and of danger, of competing ideas; a time when social, cultural, and geographical boundaries were numerous, and when that part of the world was made up of a set of decentralized loci of power.

Out of all this, perhaps in spite of it, came this basic idea that individuals could indeed relate themselves coherently and comprehensively to the events and forces of that time in a way that we are apparently unable to in our time. I want to propose, using the vehicle of a question, a way we might look at some of our common concerns for better communication across disciplines and bodies of knowledge within universities, across societies, and indeed across some of the barriers that we

know exist inside the human mind. My proposal is not a substitute, I hasten to add, for the kinds of communication and cooperation that might form around research projects or problem-solving on a global level. I also assume that for higher education in all nations there will be a continuing need to escape, at least temporarily, from a wide variety of perspectival limitations. If the words "transnational" and "transcultural" mean anything, I would assume they mean something "above and beyond" political, cultural, and intellectual boundaries. I suppose these particular words were chosen to help us lay aside certain other words which carry restrictive connotations. In turn, I am trying to push us beyond the latter. I don't intend to be rhetorical. My question grows out of an increasing feeling that generally when we discuss the role of education in overcoming perspectival limitations, we think about the changing of attitudes and the inculcation of values. We somehow expect that after four or five years of discussing, reading, and listening, people will go out into the world better able to get along with their fellow man. We apparently assume that these activities produce awareness directly, that understanding can be achieved without much real contextual experience sustained over time and reinforced carefully and periodically, that such things as a course in anthropology perhaps give one automatically a sense of what it means to be a creature of culture, and that a course in political science makes one more politically competent as he leaves the university. I do not dismiss these things as unimportant. That would be silly. But I am uneasy over the excessive faith in formal education when generally we do not ask what the climate of learning is like on a campus, or what is going on in society which is also "teaching," if you will, everybody something. I also doubt that changing attitudes, inculcating values, or otherwise relying on courses of study can be relied on solely as a means of accomplishing the objectives implied by transnational or transcultural concerns.

I would put my question this way: Would it be useful to think about a basic common intellectual agenda for faculty, students, and citizens? If we are indeed moving toward a global society, or perhaps returning to a variation on the themes of Universal Man or world citizenship or "mankind as a single species," or if we are serious about putting some reality into the notion of "spaceship earth"—if these do represent emergent aspirations and trends, what are the consequences for the educational enterprise, not viewed as curriculum in the formal sense? Is there something that should or could nudge such inclinations along? Is there a set of preconditions for them? And how might we harness student and non-student motivation? There may be a greater hunger for knowledge among the public than is either recognized or satisfied by formal education. The attendance at museums in the United States has increased significantly in the past five to seven years,

as have sales of home encyclopedias to lower income groups. Now I cite these straws in the wind because to the extent that the public does thirst for knowledge, this may constitute a natural opportunity for introducing countless persons to a wide-angle, telescopic view of their fellow men.

A Possible Point of Departure: Five Factual Premises

What I propose is *not* intended as a curriculum exercise, but rather a way of dramatizing the challenge of identifying what set of pre-conditions might begin to give life to the phrases mentioned a moment ago. Let me reformulate my question: Is it too early to begin thinking about *a common social education* which might appeal to a wide range of young people and adults inside and outside the university, and which might be based on *factual premises* which transcend the terminology often associated with (or the cause of) transnational and transcultural barriers?

As I have already noted, the idea of Universal Man is not new. And the concept need not, and should not, be just another idealized model or slogan, but rather a directional guide for escaping the perspectival limitations inherent in the viewpoints of particular cultures and societies.

You will recognize at once that the five categories of factual premises I shall mention briefly are very familiar and often appear as objectives in courses of study. Thus, they are either so obvious as to be unworthy of serious intellectual attention, or they are "technical subjects," with all that this implies. The search for a widely shared conceptual map (or perhaps, a set of maps) useful for re-focusing the intellectual resources of the university and for communicating across national or cultural boundaries might capitalize on what is obvious and at the same time facilitate the integration of specialized study.

Consider, first, *interdependence*. When you stop to think about it, this is either a cliche or it implies some things we have not begun to investigate. I suspect that it's both. And as I look at curricular and research activity, we have only just begun to explore the ramifications of a phenomenon we have reason to believe affects every single human being on the face of the earth. The types and consequences of interdependence have yet to be analyzed systematically.

When you stop to think about it, many, if not most, of the salient issues of dependency and autonomy—the capacity that men have to hurt or to help one another, the subtle ways in which they either tie one another's hands and feet or liberate one another—are inherent in complex relations which, though some are visible and some are not,

are certainly characteristic of any single individual, of any single society, and of interactions between two or more societies.

The second premise embraces *individual and group differences.* It is equally obvious, but despite the large amount of attention given to it by certain disciplines and despite its pervasiveness in everyday life, its full significance is perhaps only dimly perceived. I refer here to the "differences that make a difference" and why. What do we know (in a systematic sense) about individual and group differences that is also a matter of public knowledge? What differences are innate and hence immutable in any society or any individual—and which ones are subject to change? What individual and group differences make the wrong kind of difference because of cultural norms and social relationships that are *not* immutable or inevitable? What differences ought to be regarded as a source of enrichment of the human experience, as a source of alternative models rather than as differences to be politicized and rigidified in power structures? Bodies of research bearing on individuals, groups, and inter-group behavior can be related to a series of issues, ranging all the way from the significance of I.Q. for educational opportunity to the whole business of how one handles multicultural patterns and aspirations within a single political collectivity.

The occurrence of what I would call "negative social categorization" is, so far as I can see, present in every society and is certainly an intersocietal phenomenon. The definition of who is a friend, who is an ally, who is a stranger, who is an enemy, and under what circumstances such definitions permit either a society in its collective capacity or groups within the society to let down the barriers of constraint vis a vis others, become crucial factors in explaining much social conduct. It will sound like a gross over-simplification, but having spent many years as a researcher and teacher in the field of international relations, including the problem of peace and war, I believe that some years from now we will find that the processes of negative social categorization, i.e., defining individuals or groups so as to permit, and indeed encourage, certain kinds of action toward them, will turn out to be most crucial. In any case, while I have only hinted at some of the ramifications, my point is that individual and group differences are a fact of social life across time and across cultures, and that the roots of many of the problems we are concerned about today lie in this realm. So far as I know, there is nothing approaching a rigorous codification of even what we do know, much less a wide dissemination of that knowledge. Indeed, the whole question of what is common knowledge in this case is very much a political one.

I come to a third premise: *the supply, control, and allocation of scarce resources.* Lasswell's categories are doubtless known to most of you in the context of your own experience—wealth, health, power,

safety, respect, enlightenment. These items are more or less scarce in every society and between societies. They are subject to demand and supply; implicit or explict choices and decisions shape their distribution. It may well be, in this day and age of major scarcities, that the supply of some things known to be important to human beings is not limited. This would seem to be true of love and respect. In any case, think of the amount of profitable cross-societal learning that might result if we could indeed share the nature and consequences of the allocation of basic values. The economizing nature of social man, in whatever ideological system, is manifest everywhere. The whole matter of increasing and decreasing supply, of who makes the allocative decisions under what circumstances, of the anticipation of shortages, and of calculated alterations of supply and demand can be fitted into four or five highly technical and well-developed fields such as planning, management, decision making, and so on. However, a broader view suggests that while the human enterprise is always characterized by some degree of resource scarcity, the two exceptions I mentioned seem to me to have a potentially inexhaustible supply, yet are in fact subject to poignant shortages.

The fourth premise also implies conditions which are pervasive and must be confronted by those now on the earth and by those who will be born in the waning years of the twentieth century. I refer to *scale and complexity*. No one, unless there be a few on some island paradise (and these seem to be shrinking in number) can escape the scale of contemporary social life, or what goes with scale, namely complexity. Whether one calls this "urbanization" or not, or whether one accepts or rejects well-known pessimistic projections, clearly the world is experiencing both population growth and concentration. The ensuing problems of social organization, of governing and managing, of leadership and communication, and of freedom and restraint are becoming for all societies not only enormously significant but increasingly difficult. But I find it somewhat strange that in thinking about scale and complexity, which are as familiar as the air we breathe, we seldom step back and ask ourselves how it could be that in response to scale and complexity we have evolved an enormous variety of social arrangements, yet we seem to have almost identical problems across national and other boundaries. I don't see much difference from the standpoint of a "victim" between the real impacts of large bureaucratic organizations on clients and citizens from situation to situation. Obviously, there are differences, but the felt burdens and constraints seem basically the same. This is only one example. The larger point is whether we can share experience, analysis, and research concerning alternative models of social organization which would capitalize on economies and other advantages of scale, while at the same time we learn how to create

viable smaller settings (or micro-environments) in which individuals and groups exert substantially more direction over the means and ends vital to their existence.

The last premise in the set of five is epitomized in the phrase, *"individual social being."* Each of us is, of course, a unique organism—a behaving entity different from all others. Equally obvious is the fact that individuals are also the product of developmental processes and learning experiences largely contoured by social and cultural forces at work from birth through childhood and into adulthood. Put together, these observations suggest that the individual is in society, and society is in the individual—the two facets are inseparable and the consequences are both profound and inescapable.

Think of the phenomena that one can fit into this perspective, phenomena ranging from potential conflicts between individual desire and group norms and the impact of institutions and organizations on citizens, to how it is we find that from preliterate societies down to the present there are certain conditions under which the human personality becomes unable to function. Manifestations of the need for ego strength, emotional security, and a sense of self-worth seem to know no bounds of societal size of historical time. Are these needs basic enough so that they might provide yet another way to enrich learning from one society to another and to integrate diverse disciplines?

Conclusion

My original intent was to raise a question as one method of coming to the problem of transnational, transcultural communication in the context of higher education. The five premises should be seen as a possible base from which to clarify alternative pathways to a more holistic vision of the human condition than we apparently have at the moment. Almost everywhere men and women appear to be searching for new values or new measures of values, for new monitoring and appraisal techniques, in part because our views of the familiar are not readily revised, and in part because underlying structures and processes are not really understood by the members of society, even though they are affected by them and even though they are able to get along tolerably well. New frontiers of research, development, and teaching might conceivably be identified on the basis of such a starting set of premises. All of us can list for ourselves under any one of these categories various items which can be related to rapid and multi-faceted social change, to the permeability of national and cultural boundaries, to the forces at work in the world that are clearly reducing the likelihood that any government can completely control its destiny or its citizens. If one takes welfare, for example, one can ask if there is a political

regime anywhere which can say with confidence that it has determined the major variables affecting welfare and can manipulate them with expected results.

On balance, our age has tended to emphasize differences, oppositions, and conflicts, and this is not necessarily unnatural under the circumstances. However, if common problems have emerged within and between nations, and if there are some "facts of social life" which affect most humans regardless of locations, then there may be strong incentives for counter-balancing the above tendency. The accurate and systematic description of any near-universal attributes of man-in-society would require the concerted effort of universities the world over. Moreover, any such description, if disseminated to citizens everywhere, would bring knowledge closer to everyday existence. Both developments might make the quest for peace and well-being more realistic, more exciting to more people, and more urgent.

Discussion Report: The Relevance and Future of Area Studies Programs

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The chairman of the session, Dr. Leon Twarog, opened the discussion with a brief account of the background and current status of area studies programs in the United States. He explained how area studies programs were begun in the 1940's with the establishment of the Russian Research Center of Harvard and the Russian Institute at Columbia, and how such programs grew rapidly following the launching of Sputnik I in 1957, when the U.S. government funded the National Defense Education Act to support the study of rarely taught but critically important languages. The total number of centers grew to 107, with most concentrating on graduate training of area specialists. In the last few years, however, the concept of area studies has penetrated into undergraduate training, with the establishment of interdisciplinary courses on such areas as the Soviet Union and East Asia.

The participants were then surveyed to determine whether similar programs exist in other nations. It was discovered that in countries like Germany, Australia, and Romania, no such programs can be found. The only exceptions were France, where an American studies program is under way, and the Soviet Union, which has established an American Institute. The implication of this phenomenon was explored and it was concluded that European nations, because of the multi-cultural bent of their entire curriculum on the one hand, and the tight disciplinary boundaries on the other, do not embark on areas studies programs. More-

over, it was suggested that historically only global powers—Great Britain in the past and the USSR and the United States today—have gone into area programs. The only exceptions are special programs on the United States made necessary because most English language training and programs focus on the British tradition.

The question was raised as to what kind of American students enter these area studies programs. The chairman stated that they are primarily students planning to study or work in the area of the world concerned. This includes certain mature individuals, such as businessmen, who come back to these programs for further training. Among undergraduates these programs are especially useful in studying those areas of the world where it would be expensive or politically difficult, or both, to travel for direct study and observation.

The discussion finally turned to an examination of why the topic of area studies programs was on the agenda and how this topic related to the United Nations University. It was felt that area studies programs redress in part the ethnocentric tendency of most national curricula and often provide a real setting for interdisciplinary research and teaching. As the United Nations University begins operations, area studies programs can supply more than merely transnational approaches, but regional and transregional ones as well, and can provide regional expertise for problems of a global nature. The experience of area studies programs might also provide an interdisciplinary setting to stimulate new research problems and methods.

Discussion Report: Environmental Pollution Problems

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Two elements were evident during our discussion concerning matters of pollution. First, pollution cannot be separated from the consequences of the growth of human populations on the planet; and second, the efficiency of communications provides most people an opportunity to know where pollution difficulties may exist, and to be exposed to conflicting opinions on these matters. There is no corner of the planet that an individual can inconspicuously dispose of "waste" or pursue activities for his own interests without detection and revelation to a large audience. An example of this is the anticipated atmospheric tests of atomic devices by the French government in the South Pacific. This is, in fact, transnational pollution, characterized by maximum contradictory information available to the public.

The ranking of priorities is evidently an international concern. Risk-benefit ratios are only relevant within one country or another, whereas on a global basis there are evidently absolute measures for pollutants that are dangerous. Who should make the decision concerning how much benefit a certain population should gain at a risk to the general global environment? The opinion was introduced and reinforced that in addition to humanitarian values that influence ranking of priorities toward pollution control, both economic and political interests contribute the large proportion to decision making. How much are eco-

nomic and political interests a part of the fabric of human interests generally?

Different locations, different nations, are influenced to a lesser or greater extent by the influence of economic and political factors. It was noted that it is regrettable to have one nation consuming ten times the amount of energy or resources per individual as other nations. Natural resources provided by one nation may contribute to global pollution by supplying a higher waste-producing economy in another country on another part of the globe. Where should the regulation on raw materials be enforced—at the source or the end? The effect of an individual's consumption of raw materials may appear to him to be unrelated to conditions elsewhere on the earth. We are all removed from some aspect of the consequences of our consumerism.

One member of the group commented that the display of pictures viewed earlier (by those in attendance at the meeting) demonstrated the "absence of man from nature." Indeed, most of the nature photographs excluded humans. The group agreed that this sense of separation from "the source" contributes to our sense of remoteness from the consequences of our activities. With rare exception, the "commons" does not exist except as an abstraction in most of our minds, or possibly as a personal experience in a rural or small community. Generally we do not look at the earth as "our commons."

Transnational universities have a role in the slow process of public education; however, an acceleration must be achieved in short-term education of educators. The result within a decade should be an awareness on the part of the youngest segment of our world population of our mutual responsibilities. Transnational education should include experience as "humans as a part of nature," a living experience. Rather than perpetuating abstractions through the printed word, media, including television, are to be exploited to increase the immediacy of man's experience with nature. Media should be capitalized upon and communication systems utilized to the advantage of our global population in more ways than to simply incite people against pollution without a fuller understanding of why they should be against it.

Discussion Report: University Studies toward the Achievement of World Peace

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Assumptions

This discussion group, recognizing the diversity of backgrounds and interests of its members, nonetheless reached unanimous agreement on two basic assumptions. One, world peace is good; hence, it ought to be a primary goal of governments and individuals. Two, no member of the discussion group considered himself an expert either on the general concept of world peace or on its research and instruction within universities, even those universities in his own particular country.

Approaches to the Study

Two basic approaches to the study of world peace should be adopted by the world's universities. A strategy emphasizing specificity focuses upon the mechanisms available for the resolution of conflict, with special reference to the appropriate legal forms.

A more general strategy requires that universities deemphasize their instruction (and research) on the study of war—its causes, chronology, and consequences; in its place, the central concern of teaching should be upon the culture, literature, and social history of societies and nations. Moreover, the thrust of such instruction should be upon the demonstration of similarities and commonalities between societies and countries rather than upon the accenting of uniqueness and differences

between such groups. One principal way to achieve the university-based development of empathy for other cultures is via the active support for the international exchange of scholars.

General Problems

The discussion group addressed itself to four areas of study within universities: economics, politics, population, and studies within technical institutions.

One view held that certain economic policies ought to be restudied, under the assumption that reevaluation will occur. If international economics ought to be studied through an emphasis upon arbitration schemes, the problem becomes one of changing the scheme in such a fashion that a more plausible solution might be reached. An appropriate example is the allocation of scarce resources. International economics ought to focus upon models of distribution, with the aim of developing a more acceptable distribution system, which in turn may lead to lessening of war. Third World countries, it was suggested, ought to be more receptive to the emphasis within the academic community.

Two additional economic issues were briefly raised. The potential of econometrics was suggested, but was dismissed without discussion as a remote aid for achieving peace. And second, the focus upon dogmas rather than upon a science of economics leads only to friction.

Discussion of international political research and instruction centered on the concept of power. Although advocating a focus upon all causes of war, discussants asserted that the first goal ought to be an understanding of the concepts of "power" and the "dynamics of power systems." This, in turn, could lead to the development of mechanisms for limiting the exercise of power.

The role of university population studies in the achievement of world peace was suggested, under the assumption that wars result from population pressures. Special university support for population forecasting models must be encouraged.

Discussants also advocated the introduction of world peace mission into technical schools. Moreover, engineers were thought to need an exposure to relevant work within the humanities.

The University and Defense Industry

Much discussion focused upon the following basic question: Should universities refrain from aiding the military and defense industry? Two extreme positions were suggested. One group argued that the university can never justify aiding the business of war. Another group asserted that the university is in a position to receive substantial re-

search money from the defense industries.

Several other relevant points were raised. One discussant revealed that the military academies in many countries, rather than universities, conduct most defense-related research. Additionally, weapons are never developed directly at universities, but rather through some prior university-based scientific discovery, the implications of which were not initially known to the original researcher. Moreover, most countries receive, rather than produce, weapons; hence, there is no problem.

The discussion group concluded its session with the observation that collaboration is laudable so long as the consequences are peaceful.

Discussion Report: Uses of Modern Communication Media

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This discussion panel, consisting of approximately twelve to fifteen representatives from various countries, dealt with such subjects as information data banks, computerized learning processes, television, and aural and video-tapes. Among the areas stressed in the discussion were uses, challenges, and recommendations for the future.

In order to provide an overview of the typical uses of modern communication media, Dr. Timothy Curry of Ohio State University reported on some of the activities of the College of Social and Behavioral Sciences Laboratory. He suggested that a representative day in the laboratory might include filming of ongoing group behavior and simulation of games involving computer messages. Following this brief description, a report describing the Political Science Polimetrics Laboratory was given.

At the close of the preliminary overview the discussion group raised several questions which took the form of challenges.

1. *What can the media do about books?* (Here it was pointed out that developing instantaneous feedback systems may lead to the bypassing of books).

2. *How may appropriate communication patterns develop between professors and students and between professors and professors?*

3. *How may professors and researchers keep pace adequately with the scientific renaissance taking place in information gathering, storage, and dissemination?*

The final consideration the panel discussed was recommendations for the uses of media in the future. The participants concluded:

1. *An attempt should be made to distinguish between the role of media in research activities and in learning.* Research activities require concreteness, detail, and precision. The learning dimension, on the other hand, should focus upon the welfare of the students.

2. *Learning should be divided into two major categories: languages and the basic sciences.* It is important to note here that distinctions should be made with respect to the subject matter being transferred. Business management, for example, differs from mathematics. Thus the media techniques must vary.

3. *The professor should determine media uses rather than vice versa.* In some instances genuine face-to-face communication has a greater thrust and impact than does any form of media technology. Other situations require communication media.

Human Resource Development

Samuel C. Kelley

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Human Resources as a Concept

More than a hundred years ago, Thomas Huxley observed in England "a chorus of voices, almost distressing in their harmony, raised in favor of the doctrine that education is the panacea for human troubles. Yet, few of the many advocates of education can agree on its nature, purpose or content."

The last twenty years has produced a sweeping parallel to his experience. In that short time, the concept of investment in human resources, as the primary means for economic and social progress has received universal accord. Virtually every country, industrialized and developing, socialist and capitalist, democratic and authoritarian, has allocated an increasing share of its national product to education, and to the other activities that are assumed to develop and maintain human resources. They have created a proliferation of planning agencies and operating institutions to relate these expenditures to national goals and aspirations, yet it is doubtful that we are more certain of the nature of that relationship than were Huxley's contemporaries.

The concept of "human resources" suggests simply that the skills and knowledge embodied in people are the major determinants of the social product. Difference in the social welfare of nations is a function of difference in their stocks of these human attributes. Difference in the

rate of social progress is a function of difference in the rate at which they add to that stock. Like all other resources, these human capacities are scarce and should be developed and conserved. It follows that individual and social efforts to maintain them are acts of investment, conceptually comparable to investment in the machines and tools of production. In this sense, this university is a producer of producers goods and the social welfare and social progress will depend, in some large part, on the quantity and the quality of its products.

The rapidity with which this concept was established as the basis for public policy can be explained in the economic conditions of the past twenty years; in particular, the extraordinary economic recovery of the industrialized nations from the aftermath of the war, and the tremendous increase in the economic aspirations of the less developed world.

Investment in Human Capital: Advanced vs. Developing Countries

In the industrial countries, the postwar recovery and the effects of the war on the labor supply produced extreme scarcities of labor and obvious shortages of highly skilled manpower. These effects were only partially offset by international flows from the developing countries and by a high rate of utilization. Between 1950 and 1960, the gross national product of France increased by about 50 percent. In the same period the labor force grew by only 3 percent and unemployment averaged only 1.3 percent of the labor force, a phenomenally low rate for a market economy. The constraints imposed on economic growth by labor shortages and in particular by the limited supply of high level skills made skill development a prime concern of public policy. In this context, investment in human capital was interpreted as investment in technical and professional education.

In contrast, the developing countries lacked most of the skills essential to the organizational and technological processes that could raise productivity to levels consistent with their rising aspirations. While at the same time, large numbers of unskilled workers were unemployed or were employed in occupations with productivity below the level of minimum subsistence. Only a small proportion were employable in modern production processes. In most of these countries, the rate of functional literacy was extremely low, as were standards of nutrition and health. Further, the techniques of production and consequently the experience of workers, were those typical of handcrafts and cottage industry. In the least developed countries, 80 to 90 percent of the labor force was employed in subsistence agriculture. The human resource problem in this case is one of adapting a very large part of the working population to a new and changing economic context.

At the same time educational institutions were able to serve only a small part of the school age population, usually less than 20 percent at the primary level and 5 to 6 percent at the secondary level. Further, these and other institutions which serve human resource needs were adapted to the traditional purposes of education—the maintenance of the traditional culture and power structure.

It was this great divergence between the economic needs of the poor countries with two thirds of the world's people, the limited functional relevance of their stock of human skills and knowledge, and the limited capacities of their human resource institutions that gave great impetus to the diffusion and acceptance of the concept of investment in human capital. It was the coincidence of their needs and those of the rich, industrialized countries that produced the quantum leap in social response that has characterized the last decade.

The concept of human capital is obviously an economic concept both in its origins and its problem focus. Its initial formulation is usually attributed to Adam Smith and *The Wealth of Nations.* In attempting to explain the causes of differences in wages between occupations, he observed that "the wages of labor vary with the easiness and cheapness or the difficulty and expense of learning the business." He suggested that an individual should expect to recover through employment "the whole expense of his education, with at least the ordinary profits of an equally valuable capital."

The implications of this observation were largely ignored by economists for nearly 200 years. In his presidential address to the American Economic Association in 1961, T. W. Schultz attributed this long lag to a repugnance to the idea of treating human beings as capital goods and to the convenience to theoretical economic models of treating labor as "a unique bundle of innate abilities wholly free of capital." He argues in that paper that, "skills and knowledge are a form of capital," that their acquisition is a "product of deliberate investment" and that "its growth may well be the most distinctive feature of the economic system." He indicated a variety of important policy questions concerning economic growth and structural unemployment that appear responsive to the human capital concept and that were not well served by conventional, western economic theory.

The stimulus provided by Professor Schultz and the form of his argument has produced a flurry of rather divergent activities among economists to formalize the human capital concept in economic theory and to test it in empirical analysis. In the Western economies, the economic literature is dominated by the discussion and by empirical statements of education as the residual factor in models of economic growth or as a determinant of labor market decisions. It may be simplistic, but not overly so, to describe much of that activity as an

effort to tidy up economic theory and to achieve conceptual unity between the orthodox theory of capital and the theory of labor market. In this activity, economists have not ventured far from the conventional bounds of the discipline. Rather, they have tended to pull the discipline inward by substituting the human capital concept for a host of troublesome phenomena usually defined as non-economic and treated rather loosely by institutional economists and economic planners.

In my opinion, the human resource concept has proven most useful in application in the context of accelerated economic growth and development. Paradoxically, it is in the development context that its limitations are also most evident.

Contemporary theory of economic growth has attributed changes in income to changes in the stock of physical capital and in the supply of labor. Empirical tests of quantitative, two-factor models have failed to explain more than a part of the growth in income of the industrial economies. Professor Schultz, among others, suggested that "investment in human capital is probably the major explanation for this difference." Human capital may, in this instance, consist of the skills and knowledge embodies in labor or embodies through labor in physical capital.

Many subsequent empirical studies suggest that in the industrial countries, the quality of the human resource stock, measured in terms of education, and the quality of physical capital, measured in terms of its vintage do account for much of the previously unexplained residual in the growth equation. Apart from a continuing debate over the measurement of the consumption versus the investment component of education, most studies suggest that the return to society on investment in human capital has been equal to, and probably greater than, the return from material capital. Further, empirical studies of the differences in current expenditures on education between the developed and the developing countries indicate a strong correlation between per capita income and the proportion of gross product allocated to education, although there is an obvious problem of causality identification in such analysis.

It is also obvious, that these rather aggregate and gross expressions of relationship provide only crude criteria for policy applications. In highly industrialized societies, growth is generally a function of accumulation, and changes in the parameters of the system are incremental. The accelerated development of the non-industrial world does require radical change in system parameters and consequently more explicit and comprehensive policy criteria. Nevertheless, it is this very general expression of the social value of human capital that has led to the explosion of interest in the developing countries and radical change in their expenditures on education.

Need for Theory of Economic Development in the Context of Social Theory

One of the few things on which development economists agree is that we do not have an adequate theory of economic development. Even those authors of books entitled *The Theory of Economic Development* would accept this statement. Beyond that, the state of theory consists of a body of partial factor statements, conflicting assumptions of causality and rather sweeping conceptions of historical process. The best one can do is to attempt some synthesis of component concepts and make explicit the usual qualifications of a highly generalized process description. On the other hand, we have tested and discarded many old weapons on the fields of current combat with this problem and can present some useful guidance to the decision apparatus.

At the risk of offending the one economist among you, I suggest that there is at least a sense of agreement that the essence of economic development is structural change, rooted in the process of specialization and the division of labor. This process has as concommitment, changes in the structure of economic activity, in the techniques and scale of production, in the organization of economic activity and in the social and institutional context in which economic activity occurs. Less developed countries are attempting to achieve radical changes in productivity and standards of living in a very short period. Their technology is limited, their organizational forms simple and their cultures traditional or at least dominated by traditional forms. Development requires a major transfer of human resources from agriculture or extractive industries to manufacturing and service activities and consequently to urban areas. Economies of scale require a shift in economic organization from family-based enterprise to less personal, large scale agencies. Productivity gains require an extensive use of more sophisticated technology in all sectors and a consequent increase in the specialization and rationalization of human roles. Each of these requires complementary changes in the institutional environment. Together they require a radical transformation of the economy and the society in a cohesive simultaneous way including the full range of associated human capacities, values and role perceptions. Economists have treated only one aspect of this process, changes in technical skills and knowledge associated with changes in technology and the commodity structure of production. Human resources are treated as specific bundles of skills and knowledge consistent with a specific set of job performance functions, defined as an occupation. Both manpower bottlenecks and unemployment are perceived as a condition of structural imbalance between manpower requirements and the performance-related characteristics of the labor force. The objective of

human resource policy is to achieve balance by anticipating the changes in industrial and technical structure associated with a set of social objectives, by interpreting the set of occupational skills implicit in those objectives, and by investing in educational and other human resource institutions in ways designed to adapt the future stock of human resources to these future requirements.

In economic terminology, human resources are distributed at any point in time in a matrix of occupations and industries. The occupational distribution of employment in each industry sector describes the technical production function of that industry. The economist attempts to specify the change in the level of employment and the occupational distribution of employment in each sector as a function of the changes in the social welfare function and in sector technology. These changes in human resource requirements are the economist's criteria for allocating investment among and within the various sub-systems that develop and allocate human resources. The latter include both the systems that develop skills and knowledge and those that move individuals between industries, occupations and geographic areas.

Economists have had an extensive experience in this type of analysis in the past ten years, in both developing and industrialized countries. We have maintained a continuous debate about the mode of the analysis but with very little disagreement on the underlying form of the relationship between human resources and economic growth and development. We have become extremely sensitive to the technical limitations of economic analysis in specifying the critical functional relationships implicit in the model; the form of the social utility function; the range of alternative technologies and the process of diffusion; and the form of a production function disaggregated to sets of human input capacities. Paradoxically and in support of Huxley's scepticism, the production functions about which we know the least, are those of education, health, and those systems which affect mobility, the major policy instruments in the process of investment in human capital.

Yet on the whole, I think that we would agree that the tools of economic analysis are not the major constraints. Improvements in the state of the art through experience and the growing body of related research, as well as improvements in the information base through time, should sharpen these tools to a tolerable level of precision. The major concern is the awareness, based in experience, that the human capital construct has left the major variables out of the analysis. It is obvious that as a result of the activity of the past twnety years, the world stock of technical skills and knowledge has increased at an impressive rate. Educational enrollments have doubled or tripled at all levels of education and billions of dollars and drachmas, and rubles and pesos have been spent in the construction of educational and training facilities.

Yet it is obvious that there is no close correspondence between human resources investment, so defined, and economic development, or even economic growth. It appears rather, that the welfare gap between these countries and the industrialized countries is widening at an increasing rate. This suggests, even to economists, that the economic prescriptions for development and the interpretation of human resources as containers for technical skills and knowledge are not sufficient, in the absence of comparable and consistent prescriptions for cultural change and for the development of human capacities for socialization and performance in a complex, specialized, industrial economy.

The dilemma of the economist is, as Hoseletz has recently suggested, that the dependence of successful economic growth on social change and the mutual interaction between social structure change and economic development has been recognized ever since economists concerned themselves with problems of economic progress. Yet while the study of economic development has made great advances in recent years, the mutual dependence between changes in economic activity and organizations and in social structure is as yet relatively little explored. It appears, unfortunately, that these interactions are the principal barriers to development and the need for the development of human capacities to perform as agents in the socio-economic process is a primary aspect of human resource development.

At the risk of offending the only sociologist in the group, and while delicately avoiding entanglement in the Marxian theory of economic and social development or its alternative, the theory of social deviance, I suggest as a layman, that we do not have an adequate theory of social change. If we had an appropriate theoretical structure for understanding the mutual interactions of economic and cultural change, we would still lack an adequate theory of the learning process for implementing these aspects of human resource development. My friends among professional educators suggest a great deal of uncertainty about whether education can and does change individual or social values, without regard to the means of doing it.

Systematic vs. Component Technical Aspects of Human Resources Problems

What I believe to be important in this statement is that in the contexts in which human resources are important, the systemic aspects of problems appear more important than component technical aspects. That to treat the systemic forms of economic problems, I am forced to browse through the subject matter of sociology, anthropology, social

and industrial psychology, education and health science, and to do so with only limited criteria for selecting from the substance of these fields or mediating the frequent conflicts among their perceptions and conclusions.

The process of specialization of tasks which has contributed so extensively to productivity in economic production, has without question contributed with equal effect in the production of knowledge in the past century. The knowledge base in any aspect of any knowledge field exceeds the capacity of the individual to hold and manipulate it, and this condition pushes us to ever greater specialization of role and understanding. At the same time it limits our capacity to treat whole processes or to perceive of them in ways that are not distorted by the jurisdictional bounds of specialized disciplines.

As Schweinitz wrote in a recent article on growth, development and political monuments, economists spend more time in mastering the methods and techniques of economics and less time reading in cognate disciplines. The coming generation of economists will be better trained (as technicians) and therefore less qualified as social scientists.

The effect of intellectual specialization and the substitution of training for education on the process of economic and cultural change are not limited to those countries beginning the process of industrialization. It is equally important at the other end of the spectrum. You have had an opportunity to observe this most industrialized society from the perpective of your own cultures. You may recognize that its major problems are no longer economic, they are primarily cultural and institutional. At this point in a process of evolution, we need a restructuring of social goals and priorities and new and relevant social forms. We must somehow achieve them with the institutional means that got us here.

This university is an excellent example of our dilemma. In a great social innovation of the last century, this society decided on a massive investment in human resource development through the creation of the land-grant univeristies, in which most of you have been recently housed. They have served the society well and in many ways. They have been the principal source of new knowledge and have directed that knowledge toward social needs through extension and through a great flow of highly qualified human resources. Much of their effectiveness in the century of their existence is attributable to the specialization of tasks in the pursuit of knowledge and the depth of analysis and level of technical skill that it permits. Yet I believe that it is this characteristic that makes them increasingly less relevant to the future needs of what is now often called the post-industrial society. We are, in this country, trying to decrease the degree of functional specialization in the interest of human fulfillment, to reduce the scale of economic

units and to decentralize the economic system. The reverse of the industrialization process. Yet the university is structured on specialized roles and knowledge jurisdiction. Its values and its traditions are derived from that process and they constrain its capacity to adapt to changing needs. It is more relevant today to those countries in the middle of the process of industrialization than to those at the beginning or the end.

If we want to maximize the contribution of human resources as agents for human progress, we need new forms for human resource development. The human capacity for innovation needs to be applied to those institutions which are the principal source of innovation. We can not manage this in specialized, intellectual isolation from each other.

The theme of this conference expresses the need for a transnational and transcultural university in the interest of solutions to common problems. I should like to add a third dimension to that theme—the need for a transdisciplinary university. I would like to hope in my self interest, that this university might act to provide a model for that development.

Discussion Report: Human Resource Development

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Let me first attempt to summarize Professor Kelley's excellent paper in six propositions:

1. The real wealth of a nation resides in its human resources. In both pre-industrial and post-industrial societies, the ultimate determinants of the extent to which the nation can establish meaningful goals and make progress toward achieving them are the characteristics of its population.

2. In this context, it is important that the educational and training institutions of a society provide its members with the work skills and the know-how required by the production goals of that society.

3. But work skills alone are not enough. The educational institutions of a society must also generate the wisdom and the values necessary for solving social problems and for engineering desirable types of social change.

4. Although there is general recognition of the importance of education in the development of human resources, there is considerable uncertainty about precisely how it contributes to economic and social development.

5. Nonetheless, it is abundantly clear that the traditional disciplines operating in watertight compartments cannot solve the major problems of contemporary societies. Most of these problems do not respect disciplinary boundaries, and therefore cannot even be analyzed, let alone

dealt with, in terms of the narrow conceptual frameworks of individual disciplines.

6. Thus, there is need for modification in some of the institutions of human resource generation. Specifically, there is need for "transdisciplinary" universities, in which both the structure and the reward system will encourage specialists from a variety of disciplines to work together on problems that demand their joint efforts for solution.

There is some risk in attempting to summarize extemporaneously a discussion as rich and varied as that which Professor Kelley's paper has stimulated. It is difficult for a rapporteur to be certain of the extent to which he is reporting what has been said, rather than reflecting what he thinks *should* have been said. Nevertheless, at the risk of oversimplification, it seems to me that the discussion has focused on three general issues. The first of these is the generalizability of Professor Kelley's analysis; that is, the extent to which the human resource problems that he has identified are really common to nations with vastly different cultures, with vastly different economic structures, and at very different levels of development. On this issue, the consensus which has emerged is that while there are indeed substantial differences from one country to another in the specific manifestations of human resource problems, the basic conceptual framework is capable of embracing them all. The structure of manpower needs obviously does vary from country to country, as do the particular requirements for institutional and cultural change. Nevertheless, all countries face the necessity of meeting these needs, and in all countries the problem of generating social change demands interdisciplinary approaches.

A second issue on which the discussion has focused is one which invariably arises when an economist talks about education and training as investments in human capital. There is great reluctance to consider man as a resource, i.e., as a means rather than as the end for which all economic activity is designed. Further reflection and discussion appeared to persuade most of the participants, however, that there is no necessary conflict between means and ends in this context. Even when one defines human resources narrowly as man in his role as producer, it is clear that this role is not unrelated to the means of individual self-fulfillment. Man does not, indeed, live by bread alone, but neither does he advance very far without sustenance. Moreover, for most men success as a producer is important not only because of its implications for sustenance, but also because of the direct psychological satisfaction that productive activity affords. Finally, given Professor Kelley's very broad definition of human resources, it would seem that there is scarcely any facet of human life which is not dependent upon the nature and extent of the "investments" made in those resources.

The third major issue of the discussion relates to what might be called the implementability of Professor Kelley's recommendations. Two separate strands of the discussion can be subsumed under this heading. The first has to do with whether planning techniques are sufficiently refined to permit goals to be translated into human resource needs. The answer here seems to be that although the state of the art leaves much to be desired, it does permit us to go farther than most societies have in the direction of rational problem-solving. The second question is much more difficult. This is whether there is really any hope for substantial social and economic change in a society without a fundamental change in its power structure. On the one hand, there was the view that existing institutions reflect the vested interests of those who wield economic and political power; the likelihood that they will countenance change inimical to their interests is very small. On the other hand, it was argued that the very complexity of technology and the advance of education create change and a potential for change that is not always understood even by those who wield power in the society. Moreover, there is historical evidence of the amelioration of many social conditions in a country such as the United States. This was the debate that consumed much of the time as well as the passions of the participants in the discussion. I do not perceive that a consensus was produced by the debate, and I am not bold enough to attempt to resolve the issue here.

Science Policy in the Choice of Technology

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I. Introduction

Just as there is no part of modern life which is not touched by the products and the methods of science, there is no part of life which cannot be affected by science policy. One might approach this topic, therefore, by searching out and setting forth some grand design, a great overview of the formulation of scientific priorities and support for science. But the formulation of a grand design requires a grand command of knowledge of science and society and/or a grand personal conceit. Lacking the first and unsure about the second I shall try to find a narrower focus on which to concentrate.

I cannot discuss with any expertise the issues of science policy from the standpoint of the natural or physical scientist. But I can deal with such issues from the position of an economist. And, since as an economist I have specialized on the problems of the less developed countries of the world, I shall concentrate on science policy in the choice of technology in that context.

This is hardly a narrow focus and still offers considerable opportunity for grand designs. It is tempting to announce as others have done that "science policy" is the key to development. But that announcement would really not go far in specifying what role science policy can play in development. And, in face of such grand designs, some skepticism is usually appropriate.

Discussions of science policy and technology have often sounded a little like science fiction. Science and scientists are important but they are only an early link in the chain of causes and effects which may eventually result in an improvement in the standard of life in the poor countries of the world. Between the physical and natural scientist and the social change which may result from his work are the connections and influences symbolized by the engineer, the economist, the businessman, the worker, and the farmer. These influences may modify the application of science and the results of that application in ways never dreamed of by a scientist. Thus arguments which proceed from science policy directly to social and economic effects *are* usually science fiction simply because they do not take into account all the intermediate modifying effects which occur along the way.

A wonderful example of this for any one with just a little sense of history is the development and use of nuclear technology for generating electric power. In 1945 when the atomic bomb was first dropped there were a spate of projections of the brave new world portended by peaceful nuclear power technology. Nuclear power, it was commonly claimed, would quickly replace conventional thermal energy sources and provide new, much cheaper sources of power. That has not come to pass on the scale predicted and may never come to pass. While scientific and engineering feasibility were demonstrated in the late 1940's and 1950's, economic feasibility tests were not passed until the mid-1960's. But in the late 1960's other barriers to nuclear power were encountered. These latest obstacles associated with the ecological movement are essentially political, in the broadest sense. These new obstacles may effectively stop the spread of nuclear power stations in spite of their scientific and economic feasibility.

The first task in discussing science policy in the choice of technology in less developed countries is to clarify the nature of the technological choice problem in the less developed country context. Then I shall turn to the relation of science policy to the special technological problems of the less developed countries. A great deal of concern has been expressed in the last several years over the question of the "appropriate" technologies in the less developed countries. By thinking carefully about the technological choice issue it will be possible to clarify the "appropriate" technology question and, perhaps, to suggest ways of directing science policy to explore the question of the existence

of technologies which are more appropriate to less developed countries than those which are now available.

There has also been an increasing amount of concern in recent years with the ecological impact in both advanced and less developed countries of the implementation of new technologies based on new scientific developments. Opinions differ as to whether these ecological dangers are greater in more advanced or in less developed countries. It is not possible to answer this question here and it may not be possible to answer it at a completely general level. However, I shall try to identify the issues.

Finally, I shall turn directly to the question of science policy and ask what implications for science policy can be drawn from the issues and arguments which have been identified.

II. The Issue of the Choice of Technology in the Less Developed Countries

There are an enormous number and variety of technological choices to be made in every country, advanced or less developed. These choices are made every day, not once and for all. However, there is a great deal of inertia in technological decision making just as in other forms of decision making, so most technological choices are made in rather routine ways. Thus, the technological choice issue in the less developed countries is more obviously an issue partly because many old routines are being changed. Old ways of doing things are being changed; new goods and associated new technologies are being introduced. So the technological choice issue has a dramatic quality in the less developed countries which it has in the more advanced countries only when there is some major new innovation.

It is worthwhile to consider for a moment the range of the technological choice issue. We naturally each tend to think of it in terms of the few particular areas of science or production which we know about. Therefore we focus on only a few kinds of choices. Yet the range of new technological choice is enormous; it covers the entire range of human activity in less developed as in more advanced economies. Start with agriculture. Perhaps everyone has by now heard of the Green Revolution. That embodies an extensive set of technological choices. The Green Revolution starts with new types of hybrid wheat and rice seeds which can give greater yields per unit of land than indigenous types. These new seeds have been and are still being developed in agricultural experiment stations, with the innovations spreading from Mexico and the Philippines around the world. These new seeds are a remarkable example of the effects of certain science policy decisions. But the new seeds provide higher yields only when combined with fertilizer and

water. In a sense the new seeds make it possible to obtain the benefits of fertilizer to a much greater degree than with the previously used seeds. In order for the fertilizer to be effective more water is required. So the new seeds work best in irrigated areas. Thus the technological choices involved in the use of the new high yielding varieties of seeds also require technological decisions about fertilizer production and distribution and water storage and transport and distribution. Since the new seeds may have different degrees of susceptibility to animal pests and plant diseases, there must also be technological decisions about production of plant pesticides and fungicides. The new plants may be so susceptible to pests and plant diseases as to make them subject to attacks of epidemic proportions with consequent dangers of extensive crop loss. So it is necessary to develop procedures for reporting crop damage and technologies for quick response to the appearance of such dangerous developments.

The Green Revolution is just one, especially far reaching and dramatic example of technological choice in agriculture. There are a great many other examples in agriculture, in forestry, in fishing and in manufacturing, including the processing of the products of agriculture. For example, the increasing concern for enrichening of foods in the processing stages in order to reduce malnutrition is another dramatic technological choice issue.

In the heavy manufacturing industries there are a number of new technologies emerging in the production of iron and non-ferrous metals and in their processing. There are new developments in the machining of metals. But there are also suggestions that the less developed countries should adopt older technologies and even buy second hand equipment in the advanced countries. In construction there is a range of methods which make different requirements for different types of material and skills: prestressed concrete can substitute for steel framing in many uses, and so on.

While there is a tendency to think of technological choices in terms of manufacturing and agriculture, transportation and power generation, there are many significant kinds of technological choices to be made in the service sectors as well. For example, what kinds of hospitals should be built and how should medical services be provided in hospitals and outside of them. There are some medical technologies which have a lower requirements for medical skills than do other technologies. And some have higher requirements for elaborate facilities than do others.

There are extraordinary differences in the kinds of information distribution and information processing technologies which are available and used in less developed countries. On the desks of Indian civil servants and managers in private business one can find stacks of brown

paper file folders with their papers pinned together. These are shuffled from the "in" basket to the "out" basket with a few pencil marks. There are also on some desks piles of computer print-out. These are also studied and processed with a few more pencil marks. In some places there is active consideration of the installation of computer time sharing systems in the government bureaus and in private business.

The range of technological decisions is enormously wide and varied in the less developed countries, but no more so than in the more advanced countries. Why are there special problems of the choice of technology in the less developed countries?

In order to understand the answer to this question it is first necessary to understand at least intuitively just a little economics. But the necessary economics is so obvious, at least at the intuitive level, that it is no substantial obstacle to progress here. We start with a few general factual observations. The kinds of resources which are available in the less developed countries are often different from in the advanced countries. Even when they are more or less the same, these resources exist in quite different proportions than in the more advanced countries. These are simple truths but of profound importance.

The different resources are especially those which have to do with the local geography: the growing conditions for plants and animals and the mineral resources which exist. One major aspect of differences in resource proportions stems from the differences in the relative population densities, for example, on agricultural land. But also one of the great differences in resource proportions is in the difference in the relative amount of labor and capital which are available in the less developed as compared to the more advanced countries. By capital, I mean all the tools and equipment with which labor works, including all the improvements which have been made in land and the development of other natural resources. Of course less developed countries are not identical and not every advanced country is the same either in the relative proportions in which the resources are available. But is it true that there are important characteristic differences? These are usually so obvious that it is not necessary to belabor the point. If anyone has any doubts, let him consider the typical picture of farming in advanced countries with its tractors and harvesters and pumps and specialized buildings. Compare that with a typical picture of farming in less developed countries: a bullock or a camel pulling a simple plow, a man with a hoe, and irrigation with animal or manpower pulling buckets from a well or a Persian wheel on a river or canal.

Assuming now that we can agree that there are substantial differences in the proportions in which productive resources are available in less developed countries, what are the general implications of the fact? This is where the economic analysis comes in, but the insight

which it provides only confirms what our intuition tells us. The largest possible output is obtained from technological choices which, all other things equal, use resources in the proportions in which they are available. If technological choices are made with this rule, that will generate a larger amount of production than if the rule is violated or ignored. Should anyone have any doubts about this, let him perform the following mental experiment: consider violating the rule, say, by adopting absolutely the most machine-intensive system of information transfer, processing and retrieval. Suppose a system of modern high speed digital computers was purchased by a less developed country, one which absorbed nearly all the resources which otherwise could be used to provide tools and equipment for farming and manufacturing. Can anyone imagine that would be a reasonable thing to do? Should some sectors be completely neglected in terms of capital while other sectors are inundated with it? It does not seem to be a good way to get as much out of the available resources as can be achieved. And it is not. It is not necessary to go into the details of a rigorous demonstration of the argument here. There is such an argument, but its main conclusions are so plausible that they can be accepted by most people on the basis of an intuitive discussion.

Now the factual observations and the logical argument can be pulled together to draw some conclusions about technological choice in less developed areas. First, the productive resources which are available to such countries are often different and nearly always exist in different proportions than in advanced countries. Second, the best use of resources requires that the technologies adopted should in an overall way absorb resources in the proportions in which they are available. That implies that to achieve the largest output, the technologies adopted in the less developed areas should, in general, be different from those in the advanced countries. This is the basis for the argument that the technologies most "appropriate" for less developed countries are different from those in advanced countries. And, it seems to follow that science policy in less developed countries should be directed toward generating different technologies than those used in advanced countries.

It is now quite fashionable among people who worry about science policy and the choice of technology in less developed countries to worry about the issue of "appropriate technologies." The phrase "appropriate technologies" has even become a catchword in certain circles. The U.S. Agency for International Development has given a grant of roughly a half a million dollars to M.I.T. to investigate the possibility of finding particularly appropriate technologies for less developed countries. Another, smaller grant was given to the Academy of Sciences and the Academy of Engineering to undertake a pilot project to identify appropriate technologies or to find means of identifying such technolo-

gies. The Economic Growth Center at Yale University has a substantial project on the investigation of technology in less developed areas in order to find more appropriate ones. The Organization for European Cooperation and Development started last year a substantial project investigating technology with the hope of finding more appropriate technologies for less developed countries or learning how to find them. There are similar projects in other parts of the world. Judging from all this activity we are in a very fashionable area of inquiry when we consider the question of choice of technologies which are particularly appropriate to less developed countries.

But all of this activity may also raise a question in our minds. Why this burgeoning concern with the searching out and using appropriate technologies in less developed countries? Based on the previous discussion we should have concluded that the problem is as old as the less developed countries. It should have been a matter of concern as soon as concerted attention began to be directed toward the problems of the less developed countries.

To answer this question and gain some perspective on the appropriate technologies fad in the development literature, it is instructive to review briefly the history of fashion in attitudes toward the less developed countries and how their problems were to be solved.

Perhaps the first view to be popular, at least in the U.S., was embodied in President Truman's famous Point Four of his inaugural address in 1949, which began the U.S. foreign aid program. That Point Four envisaged U.S. aid primarily in the form of technological assistance. It incorporated the diagnosis of the problems of the less developed countries as arising mainly from the fact that they were not using efficiently the resources which they had. To lift them from their poverty would just require the efforts of some smart agronomists and industrial engineers. By instructing peasants on how to improve their farming practices—to plant their seeds more deeply or less deeply, when to irrigate and when not—and by instructing manufacturers on how to produce—using more heat or less, different machines or processes—it would be possible to overcome the problems of backwardness. The obstacles to development were ignorance—and perhaps bad work habits—all of which good advice and encouragement would overcome. This might be called the "cheap development" phase of fashionable thought on economic development.

It did not take long, however, for the simplifications in this type of thinking to be overcome. By the early 1950's it was realized that economic development required more resources, particularly more capital resources, than were at the disposal of the less developed countries. Having learned that lesson it became the new fashion, and the makers

of economic policy to a considerable extent acted as if that were the only lesson it was necessary to learn.

Actually the policy of providing capital assistance did not work so badly in the 1950's and the 1960's. The growth performance of the less developed countries during the last twenty years has been quite respectable. It has averaged over three to four percent in most countries, with substantial variations over time and among countries. But it is a big change from the stagnation which characterized the less developed countries before the Second World War. And the growth performance compares favorably with the performance of the advanced countries of the world, with the exception of a few "miracle" countries such as Germany and Japan.

However, by the late 1960's and early 1970's it became fashionable to deprecate the performance of the less developed countries over the past two decades. The "development decade" of the 1960's has come to be regarded as a failure. But who could have reasonably expected development to come in a decade? The notion of a "development decade" was itself a misleading and self-defeating idea, as if at the end of the decade, having solved the problem of development, it would be possible to turn the attention of the world to other matters.

The next lesson learned was that economic growth is not enough to solve the problems of the less developed world. In the process of growth, the phenomenon of growing unemployment emerged. The growth process has been accompanied by an extraordinary process of urbanization in most of the less developed countries of the world. One aspect of that urbanization has been the growth of open unemployment in the cities. The reasons why people migrate from urban areas and join the ranks of the unemployed when there is already a substantial amount of unemployment are not well understood. There is no doubt as to what happens, however. In spite of large scale investments unemployment problems have become more open and much worse in most less developed countries over the last twenty years. Perhaps the emphasis should be on the word "open." The problems of important amounts of labor which were not effectively employed full time at their jobs may well have existed for many years. It may only have emerged in the process of development as an *open* unemployment problem.

It has naturally occurred to many people to ask why the relatively high rate of investment in the less developed countries has not been accompanied by a high rate of employment. On close inspection it appears that the kind of investment which has taken place in the less developed countries has often not been one which can absorb large amounts of manpower. The production technologies which have been chosen are technologies which are usually not very different from the technologies which are used in the advanced countries of the western

hemisphere and western and eastern Europe. These are technologies which are not out of place in situations in which labor is scarce relative to capital and, therefore, relatively expensive. Moreover, labor is becoming relatively even more expensive as compared to capital plant and equipment of most types. The technologies of the advanced countries *appear* to be labor saving. In the less developed countries, however, where labor is plentiful relative to capital, the best choice technology, if it existed, would be one in which labor was used relatively intensively and capital was economized. Moreover, a more labor intensive technology would also ameliorate unemployment, though it might not eliminate it. On the other hand, a technology which is more appropriate because it is more labor intensive might also be capable of producing less output. So there may well be a trade-off between technologies depending on social goals: unemployment or output.

Nonetheless, the view has now become fashionable that the less developed countries have adopted "inappropriate" technologies and the most important task now is the searching out of the "appropriate" technologies for the less developed areas. In some discussions of the problems of unemployment and appropriate technologies it is suggested that the use of the "inappropriate" technologies in the less developed countries is the result either of a kind of international conspiracy or the inevitable workings of the western capitalist system. Either or both of these processes are purported to be justified by the advantages which the advanced countries have in exporting "inappropriate" capital instead of labor intensive technology to the less developed countries. In other arguments the supposed capital-intensive bias in western technology is a straight-forward response to the relatively high labor wages as opposed to capital costs.

There is certainly no consensus now on what is meant by "appropriate" technologies. We have discovered that the choice of the best technology may depend on what a society's goals are. There may not be one choice which is best for all possible objectives. Suppose the goal is to produce as much as possible with the available resources and to grow as fast as possible. Then the most "appropriate" technology may be different than if the goal is to provide jobs for the maximum number of workers, forgetting about how much each one and all together produce. To some extent the present mood about the technologies which have been used and what would be more appropriate reflects a change in objectives with more stress placed on employment now then ten or fifteen years ago.

But, even taking into account a change in objectives which may have occurred, is it *possible* to find technologies which are more appropriate than those which have been used in the past? If technologies could be found which increase the use of labor and reduce the use of capital,

those might even make it possible to have one's cake and eat it too—to increase employment and achieve higher levels of output. But are there more appropriate technologies?

To attempt to answer this question would be to prejudge the results of the extensive research which is being done. But I do want to be skeptical at this point and at a later point to suggest possible lines of research on the issue. If there are more appropriate technologies than those which have actually been used, where have they been hiding? And can science policy help to find them?

There have often been good reasons for the particular technologies adopted. In many cases there have been conscious efforts to consider all the alternatives and pick out the best one. In other cases a particular technology has been chosen for a less developed country just because that was the one used in the country providing the foreign aid or the technical assistance or the consulting firm. But that might not be such a bad reason for adopting a technology. It often means that the technology is a familiar one and that most of the bugs or difficulties in working the technology have been eliminated. Such a reason may be conclusive since adjustments of new technologies requires time and time delays are expensive.

The argument that it should be possible to find more appropriate technologies for the less developed areas usually goes in the following manner. The present technologies which are used in the developing countries have, for the most part, been worked out in the more advanced countries. These technologies have therefore been evolved in conditions in which the relative proportions in which productive resources are available are quite different from the proportions which exist in the less developed countries. If the scientific and engineering research which has gone into the technologies of the more advanced countries had taken place in the environment of the less developed countries, quite different production methods would have emerged which would be more appropriate to the less developed countries.

This argument assumed a high degree of malleability of nature. It presumes that, if one looks long and hard enough one can find labor intensive ways of making steel and fertilizer and other products which we now regard as requiring a relatively large amount of plant and equipment.

When skepticism is expressed about the existence of "appropriate technologies" a common reaction is that it is always possible to *imagine* more labor intensive ways of making anything. But existence in the imagination is not the only requirement for a technology. The technology must also be physically and economically efficient. Any amount of labor can be absorbed by using it inefficiently, and there are an infinity of ways of being inefficient, of using more of all resources for

a particular product than is required. If there are more labor-intensive technologies in existence than are now used in less developed countries or if they can be found, they still have to pass the test of economic efficiency.

Another technological choice problem for the less developed countries which has gained attention in the last several years is related to the issue of ecological damage associated with particular technologies. The views on this question range from catastrophic to apathetic. The catastrophic views are associated, for example, with Paul Ehrlich, one of the prophets of doom. Ehrlich warns that the fertilizer-and-pesticide-intensive farm technologies which are being exported to the less developed countries will soon poison the rivers and the ocean shores of such areas. The result will be a drastic reduction in the fish catch and consequent increase in protein deficiency. At the same time that miracle seeds are producing miracle crops, miracle rats are mutating to survive the pesticides and eat the miracle harvests, leaving even less behind for the workers of the miracle than there was formerly.

To the approaching ecological disaster in agriculture can be added the prospect of ecological damage done by industry in less developed countries. It might be argued that the conditions of life in the urban areas of the less developed countries are such as to make the urban populations even more susceptible to such ecological damage than are the populations in more advanced countries. In the cities of the less developed countries the people typically live in more crowded and less sanitary conditions. The water supply is less reliable and more likely to be polluted. Sanitation facilities are often primitive. There is already considerable air pollution because of reliance on cow dung and wood fuels or soft coal. And, because of relative poverty and the lower level of nutrition and health care the resistance of peoples in less developed countries to further debilitation from ecological hazards is less.

The conclusion, or at least the warning, which follows from the detailing of the ecological horrors is again that the technologies which are imported from the more advanced countries are the wrong ones. The less developed countries should choose production methods which do not repeat and intensify the ecological mistakes which have been made elsewhere.

What then accounts for the apathy with which the ecological warnings have been received in the less developed countries? The reaction typically has been that there are more important things to worry about than more smoke in the skies of the cities and more chemicals in the river. The struggle for life is so intense at this point that an advantage, even a momentary one, which may be gained in the standard of living from an ecologically damaging technology, cannot be sacrificed. Moreover, it is easier to talk about better technologies which will not

damage the environment than to actually find them and put them to use. And, just as there is no free lunch in the world, neither is it possible, in most situations to forego ecological damage and get the same output except at a higher cost. And higher costs are particularly heavy burdens for the less developed countries.

So far the context in which the choice of technology has to be made in the less developed countres and the issues involved in that choice have been described. What lessons or guidelines does this discussion suggest for science policy?

III. Science Policy for Improving the Range and Choice of Technology in Less Developed Countries

Science policy often appears to be a rather abstract concept. When we consider other types of policy certain specific types of action come readily to mind. Fiscal policy means taxation and government expenditures. Health policy has to do with doctors and nurses and medicines and hospitals and clinics. But what is science policy?

It will help to make science policy concrete if we consider it in terms of the specific tools which may be used to implement it. The tools of science policy are: (1) education expenditures at all levels but particularly at the advanced level at which scientific personnel are produced; (2) research and development expenditures and organization; and (3) implementation of new innovations, which, while less an aspect of science than of business and economics, is so central to the efficacy of science policy that it should be considered with it.

An economist considering science policy in terms of these particular tools immediately thinks of what they will cost and the other ways in which the resources might be used directly for other types of investment for development purposes. Science policy when considered in terms of the tools mentioned certainly is *not* cost-less. For example, the education of scientists is the most costly type of education. It requires Ph.D.'s for the instruction of more Ph.D's. That means scientific education lasts a long time, which contributes to its expense. Scientific eduation also requires laboratories and equipment that other types of education do not require—and that is a major reason why it is comparatively costly.

Research and development activities also are expensive. They absorb manpower, which is particularly scarce in less developed countries. The technicians, engineers, and scientists involved in research and development activities could be otherwise directly involved in production activities or in teaching. Or possibly if such large amounts of research and development were not planned it would not be necessary to have so many scientists and technicians, and that would be a saving. The

research and development activities also require laboratories and equipment. Since it is relatively sophisticated stuff most of the less developed countries will have to import it. The foreign exchange required is also a particularly scarce resource for most of such countries.

The material and manpower requirements of science policy can easily add up to quite a large bill. In fact it is the size of that bill which has discouraged the less developed countries from having done more science up to this time. It would be a mistake to think that the less developed countries have, in a fit of absent-mindedness, simply overlooked a highly promising means of improving their position with hardly any cost at all. Certainly science policies have occurred to the leaders of all the less developed countries, if for no other reason than that scientists are effective lobbyists. But the bill for the programs which the lobbyists have put forth is a large one.

The United Nations World Plan of Action for the Application of Science and Technology calls for developing countries to spend one percent of their GNP on Science and Technology. Is one percent of GNP a large amount? It certainly doesn't sound like very much—just one hundredth of the total gross national product. But remember that the total amount of domestic saving and investment in a typical less developed country may only be ten percent of the gross national product. So if one considers allocating one percent of the GNP to science, that may well be ten percent of total investment.

In addition the World Plan calls for the advanced countries to devote one twentieth of one percent of their GNP to support science and technology in the less developed countries. Remember that the advanced countries are now devoting less than one percent of their GNP to provide economic aid of all types to the less developed countries. So this part of the World Plan calls for more than one twentieth of all economic assistance to the less developed areas to take the form of support for science and technology. Recall also that most of the foreign economic assistance to the less developed countries is assistance to investment by these countries. So the allocation of this part of the aid to science policy is another diversion of investible resources.

Finally the World Plan calls for the developed countries to devote five percent of their non-military research and development to specific problems of the developing countries. It should not be thought, moreover, that the more advanced countries are likely to consider this latter allocation as an amount to be made *in addition* to their other assistance to the less developed countries. These resources allocated to research and development in advanced countries for the solution of the technological problems of the less developed countries would probably be considered a part of the total resource grant to the less developed countries. Therefore, the latter allocation is also likely to be a deduc-

tion from resources that would otherwise be available for investment purposes.

So the World Plan represents a relatively large allocation of resources to science policy. Add to it the allocation of funds for science education and the sum is even larger.

An allocation of funds to science policy or any other investment program can be considered to be a bet on the future pay-off of the allocation. Some investment bets which one makes for development have quite a high probability of pay-off. A new textile mill—with reasonable effectiveness in planning and management—will almost certainly produced textile. It is not such a risky and difficult undertaking to get the textiles out of a new mill at more or less the rate as planned. The rate of pay-off of the textile mill can be quite good—ten percent to thirty percent depending on conditions.

Thinking of these terms a bet on science policy may have a much higher pay-off. That is its rationale. But a bet on science policy is a risky bet. How risky? It is even hard to know that. But it is not like a bet on a new textile mill. Is it possible to shift the risk to the more advanced countries by getting them to do the research and to use their science facilities? Not if one thinks that any resources diverted will represent a subtraction from the total amount of resources which the advanced countries would be willing to give to the less developed countries.

So we may as well face up to the situation. Science policy is less developed countries can be a large, risky bet. Putting the matter in those terms leads us to think again and seriously about the risks and the pay-offs.

Science policy for improving the choice of technology in less developed countries means looking for production methods which are particularly suited to the resources of those countries. If it were not for that last special twist, the less developed countries might be well advised to let the more advanced countries make the bets and take the risks of research and development. And then the less advanced countries could use whatever comes out of the scientific activities of the more advanced countries. They will have to pay, of course, in royalties and purchases of patent rights for new technologies. But at least they can know what they are getting when they buy a known technology.

What are the chances that science policy in and for less developed countries would end up producing new science and technology which is much better adapted to the conditions of such countries? Can we set any limits to the riskiness of the bets which are implied? If we could answer this question we could also know in what areas to allocate the funds for science policy.

Unfortunately there are no ways of looking behind the walls of ignorance without using the resources necessary to knock holes in the walls. Perhaps we know enough to know, however, that there are no general answers: that science policy in some areas is more likely to pay off than in other areas. Speculation along these lines might take the following approach.

There are many manufacturing technologies which have received a good deal of attention and have benefitted from science and technology. But many of the new technologies have, first of all, not been found as the result of a directed search in scientific laboratories for labor-saving technologies. Much of the new technology is really associated with new products. Can anyone really think that Westinghouse or Edison or Ford or the Wright Brothers were looking for labor-saving-capital-using technologies when they worked out the implications of some new ideas for electrical power and the application of internal gas combustion engines? In modern times was that the motivation of Bell Telephone Laboratories and William Shockley in the development of the transistor? It is hard to believe.

Thus it is necessary to be skeptical of the argument that the science policy of the more advanced countries has been motivated by the desire to save labor and use more capital.

The same argument cannot be made about many development activities, however. Much of the work which has transformed science into technology has gone on in industrial laboratories and in pilot experiments in which the relative costs of labor and capital must certainly have been important considerations to the scientists and engineers who were involved.

But is it correct to believe what has become almost an article of faith in some circles: that the new science and technology which has characterized the last hundred years has been primarily labor saving and capital using. The evidence for this is equivocal at best. Much of what passes for labor saving technology is also capital saving and it is difficult to know whether it is more of one than of the other. Many observers have been misled by the large scale of production which is involved in much of the new technology. The new steel mills of the 1970's are much bigger than the steel mills of the 1870's, and so on and on. If one looks carefully at the productivity of capital and the productivity of labor, however, both have improved and one not clearly more than the other.

This point has considerable significance. Suppose the capital intensive bias of technology developed in the advanced countries is called into questions. Then the influence of relative labor scarcity and capital plenty on the development of new technology must also be questioned. That is, there may have been *no* bias in the discovery of new tech-

nology in advanced countries. And, if that is the case, it also casts doubt on the possibility that science policy directed toward finding new labor intensive technologies in less developed countries will be successful. The engineering opinion which I have sampled in a casual way tends to be skeptical on the prospects for finding new, economically efficient, labor-intensive technologies. That opinion, of course, is not decisive since it is not based on careful research. Neither should it be neglected, however.

I would, in fact, advance the hypothesis that there is a bias in nature: a bias against efficient, labor intensive techniques in manufacturing. That does not mean that there is a bias for capital intensive techniques. But it does imply that there may not be a great range of undiscovered labor intensive technologies for industrial production. The hypothesis is based partly on observations of the requirements for producing, cutting and shaping metal which are a substantial part of all manufacturing. The hypothesis is also based on observations of what is involved in assembly operations, chemical processes, electronic goods production and some other manufacturing operations. A great many of these operations technically require substantial capital equipment in relation to manpower if they are to be carried out at all. There are frequently important economics of scale in such capital equipment, the higher the level of output for which the equipment is constructed, the lower will be the costs of production up to a relatively high limit at least.

I advance the bias-in-nature hypothesis with some intellectual commitment to it. I think it will turn out to be correct in many manufacturing activities, though not necessarily in agriculture or in service activities. Therefore, I am influenced by this hypothesis in any further recommendations I would suggest for science policy for the choice of technology in less developed areas. However, as I shall argue, other important considerations lead to the same type of recommendations as the hypothesis above.

The making of science policy in less developed areas is another example of a situation in which there are many things to do and no clear guides as to which to do first and in what proportions each possible activity should be pursued. In such situations it is natural to look for a procedure which would lead to some kind of social optimum. Economists like to come up with such principles. For example, economists usually advocate free trade and the reductions of tariffs on the grounds that such policy will lead to a social optimum. But science policy is a field in which there are no obvious grand principles to follow. In such circumstances it is natural to ask if there are any priorities which can be established on the basis of fairly obvious, common sense reasoning. I think that this is the case.

For most of the less developed areas a high priority for science must be the improvement of technologies used in agriculture. In many of the less developed countries of the world large parts of the populations are still malnourished—if not actually hungry most of their lives. Yet we have had in the Green Revolution dramatic evidence of what science policy in agriculture can accomplish. With important exceptions most scientific research in agriculture has not been directed toward the problems of the less developed countries. This is simply because most of the advanced countries happen to be in temperate zones while most of the less developed countries are in semi-tropical zones. Agricultural techniques are usually highly specific to particular localities. I would not argue that there is a bias in nature against increasing agricultural productivity in tropical and semi-tropical areas. But since there has been a relative neglect of the problems of these areas, I would argue strongly that tropical and semi-tropical agriculture is prime field for new scientific effort in less developed countries.

Another high priority area of research should be the tasks of improving nutritional standards of the peoples of the less developed countries. Again this has not been a completely neglected field by any means, but much more needs to be done as it is still a comparatively new area.

The next high priority problem for science research is that of population growth. This is an example of scientific problems created by social and economic conditions. Effective means of limiting population growth are now available. However, these techniques are often either expensive or involve the violation of individual and/or social mores in unacceptable ways. The challenge is to find population control techniques which do not have such characteristics.

After one has mentioned the foregoing issues, which are of overriding importance in most less developed countries, it is difficult to continue at such a level of generality. But that is not important. A search for generality should not stand in the way of making correct policy. There are many particular problems in each country which require scientific effort. Each country has its own somewhat unique geographical resources. These create special areas of economic opportunity and generate somewhat different scientific priorities for each of the less developed countries.

All well and good you might say. But what about the high and increasingly difficult unemployment problem of the less developed countries? This is the problem that generated the concern for finding "appropriate" technologies. Cannot science policy do something about unemployment? I confess that I think it unlikely in the manufacturing sectors. That does not mean that research should not go forward in trying to find more labor intensive technologies which also meet tests of economic effeciency. But, if the engineering sentiment, which to a

considerable extent my own view only reflects, is accurate, success in finding appropriate technologies is not likely to come easily. On the other hand, in the agricultural sector it seems more feasible to be able to continue to develop relatively labor intensive methods which can effectively compete with more capital intensive techniques. Like all good research, the search for appropriate technologies must be carefully planned. That, too, requires research in which scientists, engineers and economists must collaborate. It is difficult and expansive and, for those reasons, seldom done.

Science policy must be made now on the basis of hunches—lessons drawn intuitively from unorganized experience. That is not a good scientific technique and it is not a good technique for making science policy. A major task for science policymaking is to establish a methodology which is something better than informed guesses by experienced men.

Discussion Report: Science Policy in the Choice of Technology

Jon Cunnyngham

Chairman of the Department of Economics
The Ohio State University

The final plenary session on Transdisciplinary Development of Resources centered around the presentation by Professor Richard S. Eckaus, "Science Policy in the Choice of Technology." This paper discussed in a three-fold context the role, in less developed countries, of science policy in the choice of technology:

1. The nature of the problem of technological choice.
2. Special problems in the choice of technology.
   a. The problem of "appropriate" technologies in less developed countries
   b. The problem of ecological impact when implementing new technologies.
3. The science policy implications drawn from these problems.

Professor Eckaus began by describing how economic and ecological problems often inhibit the widespread use of technology, citing the history of the development and use of nuclear power as a prime example. He then illustrated the complexity and range of new technological choice by specifying some of the interlocking choices involved in implementing Green Revolution technology in agriculture and by discussing a range of significant alternative choices in technology.

To put the special technological problems of less developed countries into perspective, Professor Eckaus described some of the differences between the kinds and proportions of resources in these countries and

those in the advanced countries. Using the history of attitudes toward the problems of less developed countries, he explained the concept of "appropriate" and "inappropriate" technologies. This led to a discussion of the concept of capital/labor ratios and the economic view that an appropriate technological choice should employ techniques which use the resources already available. Thus, if a less developed economy is labor intensive, the technology chosen should also be labor intensive.

This could be interpreted as a science policy guaranteed to keep the less developed countries less developed. In fact, however, the recommendation is only that the best choice of technology in a labor intensive economy is one in which labor is used relatively intensively and capital is economized. Such a choice of technology, if available, could well increase both output and employment at the same time.

Unfortunately, such an ideal choice of technology may not exist. Introducing a potentially fatal weakness in the logic of "appropriate" technologies, Professor Eckaus asked, "Can we assume that *efficient* labor intensive technologies are possible?" After discussing the many costs and problems involved in trying to discover labor intensive technologies in less developed countries, the cost-effectiveness of such a science policy was questioned. This view was summarized by a hypothesis, described as "Eckaus's first law of nature," that such technological choices are ruled out because "there is a bias in nature against efficient, labor intensive techniques in manufacturing."

Professor Eckaus concluded his presentation with a list of three high priority needs in most less developed areas to help guide science policy:

1. The improvement of technologies used in agriculture.
2. The improvement of nutritional standards of the population.
3. The development of techniques for limiting population growth.

Following the lecture, five participants, each from a different country, were asked to serve as a panel to initiate the discussion under the leadership of Professor Geoffrey Keller. The audience later joined in. Three questions were posed to the panel and the audience:

1. Does the choice of technology involve psychological problems?
2. Should there be more services in rural areas?
3. How severe is the hazard of the destruction of new food technologies?

Professor Keller then called upon the panel of participants for their remarks. In the discussion that followed, members of the panel and audience expressed a number of important views. In brief, they included the following remarks:

1. Priorities of highly developed countries are really not so different from those of developing countries.
2. The development experience of higher developed countries is an important source of information for developing countries. Industrial-

ization is the key to economic development.

3. The structure of economic interdependency of countries, however, is an important constraint on the available choice among technologies.

4. Technologies embodied in human capital offer a great opportunity for local technological adoption in the future.

5. Future factor proportions may be more important for science policy than current factor proportions.

6. Population and pollution are very high priority problems in developing countries.

7. Developing countries should establish their own pace and not try to match the expectations of the more developed countries in either development or life style.

8. Integration of form and function to improve the quality of human life is also an important technological problem. The human factors needed for this integration require both education and a common background.

Appendix A: Conference Program

Monday, May 14, 1973

4-6 P.M. Registration

6:00 P.M. Reception

7:00 P.M. Dinner

Welcome: Osborn T. Smallwood, Conference Chairman

Introductions

Remarks: Albert J. Kuhn, Provost and Vice President for Academic Affairs, The Ohio State University

Tuesday, May 15, 1973

9:00 A.M. Plenary Session

Address: "The Feasibility of a United Nations University"
Ward Morehouse, Director, Center for International Programs and Comparative Studies, University of the State of New York

10:15 A.M. Coffee and Tea

10:30 A.M. Discussion Groups: Implementation of the United Nations University Concept

A. Staffing
Discussion Leader: Jerrold R. Voss, Chairman, Division of City and Regional Planning
Rapporteur: Howard Gauthier, Professor of Geography

B. Programs
Discussion Leader: Chadwick Alger, Professor of Political Science
Rapporteur: Frederic Cadora, Director, Middle Eastern Program

C. Students
Discussion Leader: Charles Babcock, Professor of Classics
Rapporteur: Ivan Rutledge, Professor of Law

11:30 A.M. Reports from the Discussion Groups

12 NOON Luncheon

1:30 P.M. Group Photograph

2:00 P.M. Plenary Session

Address: "Transnational and Transcultural Emphasis in University Curricula Development"
Richard C. Snyder, Director, Mershon Center, The Ohio State University

3:15 P.M. Coffee and Tea

3:30 P.M. Discussion Groups

A. The Relevance and Future of Area Studies Programs
Discussion Leader: Leon I. Twarog, Director, Slavic and East European Studies Program
Rapporteur: Samuel C. Chu, Director, East Asian Studies Program

B. Environmental Pollution Problems
Discussion Leader: Paul Taiganides, Professor of Agricultrual Engineering
Rapporteur: John D. Briggs, Professor of Entomology

C. University Studies Towards the Achievement of World Peace
Discussion Leader: John Kozyris, Professor of Law
Rapporteur: James Harf, Professor of Political Science

D. Use of Modern Communication Media
(Information Data Bank, Computerized Learning Processes, Television, Aural and Videotape)
Discussion Leader: Philip M. Burgess, Director, Behavioral Science Laboratory
Rapporteur: James L. Golden, Professor of Speech Communication

4:30 P.M. Reports from the Discussion Groups

5:00 P.M. Adjournment for the Day

6:00 P.M. Private Dinners

Wednesday, May 16, 1973

9:00 A.M. Plenary Session: Transdisciplinary Development Of Resources (Part I)

Paper: "Human Resource Development" Samuel C. Kelley, Director, Center for Human Resource Research

10:15 Coffee and Tea

10:30 A.M. Discussion: A panel of participants will be asked to react to the paper by Dr. Kelley
Discussion Leader: William M. Protheroe, Professor of Astronomy
Rapporteur: Herbert S. Parnes, Professor of Economics

12 NOON Luncheon

No program is planned for the afternoon. Participants are invited to tour the campus and visit departments, centers, or laboratories of special interst to them.

6:00 P.M. Dinner

8:00 P.M. Address: Harold Taylor, former President of Sarah Lawrence College
"Universities and Transnational Approaches to the Solution of World Problems"
This lecture on the theme of the conference will be open to the public. Room 131 Hitchcock Hall, 2070 Neil Avenue

Thursday, May 17, 1973

9:00 A.M. Plenary Session: Transdisciplinary Development of Resources (Part II)

Paper: "Science Policy in the Choice of Technology"
Richard S. Eckaus, Professor of Economics, Massachusetts Institute of Technology

Discussion: A panel of participants will be asked to react to the paper by Dr. Eckaus
Discussion Leader: Geoffrey Keller, Professor of Astronomy
Rapporteur: Jon Cunnyngham, Chairman, Department of Economics

Conference Summary and Evaluation: Conference Chairman

Acknowledgements

Announcements

11:00 A.M. Conference Adjournment

Participants are invited to have lunch in the Fawcett Center for Tomorrow dining room before their departure.

Appendix B: Conference Participants

Foreign Scholars

Name, Position, and Home Institution	Field	U.S. Affiliation
Magne Aarbakke Lecturer Bergen Technical School Bergen, Norway	Engineering	South Dakota School of Mines and Technology Rapid City, South Dakota
Petru Agafitei Lecturer in Industrial Engineering Polytechnic Institute Iasi, Romania	Engineering	University of Illinois, Urbana, Illinois
Mehri Ahy Director, Language Center Head, Russian Department University of Tehran Tehran, Iran	Language and Literature	University of Illinois Urbana, Illinois
Nicolae Antonescu Instructor in Engineering The Institute of Petroleum Ploiesti, Romania	Engineering	Illinois Institute of Technology Chicago, Illinois
Alfred Bichler Resident University of Innsbruck Innsbruck, Austria	Medical Sciences	John Hopkins University, School of Medicine Baltimore, Maryland

Jaime Chiang Acosta Former Rector Technical University Federico Santa Maria Valpariso, Chile	Chemistry	Louisiana State University, Baton Rouge, Louisiana
Gabriel Chikwendu Chidolue Lecturer, Power Systems Engineering School of Engineering University of Zambia Lusaka, Zambia	Engineering	University of Pittsburgh Pittsburgh, Pennsylvania
Helene Christol Professor Agregee University of Provence Aix-en-Provence, France	Language and Literature	Southern Illinois University, Edwardsville, Illinois
Robert Allan Cowan Researcher, Department of Steroid Biochemistry Royal Infirmary Glasgow, United Kingdom	Biochemistry	University of Wisconsin Medical Center
Jerzy J. Czyzewski Physicist, Institute of Experimental Physics University of Wroclaw Wroclaw, Poland	Physics	National Bureau of Standards Washington, D.C.
Luigi Del Grosso Desteri Assistant Professor School of Sociology Trento, Italy	Sociology	North Texas State University Denton, Texas
Mircea D. Driga Lecturer in Electrical Engineering Petroleum Institute Ploiesti, Romania	Engineering	University of Texas Austin, Texas
Nicole Dupre Instructor of Comparative Literature University of Chambery Chambery, France	Language and Literature	University of Kansas Lawrence, Kansas
Constantin Frasinel Assistant Lecturer Department of Plant Physiology University of Iasi Iasi, Romania	Animal and Plant Sciences	University of Maryland, College Park, Maryland

Takeo Hatae Professor of Architecture Kogakuin University Tokyo, Japan	Architecture	The University of Texas at Austin Austin, Texas
Adrian Charles Herington Researcher, Department of Biochemistry Monash University Clayton, Victoria Australia	Biochemistry	Washington University, School of Medicine St. Louis, Missouri
John Joseph Hopwood Researcher, Department of Biochemistry Monash University Clayton, Victoria Australia	Biochemistry	The University of Chicago Chicago, Illinois
Teodor Huidu Assistant Lecturer Faculty of Mathematics and Mechanics University of Bucharest Bucharest, Romania	Engineering	Case Western Reserve University Cleveland, Ohio
Kazuo Inazawa Staff Member, Foreign News Section Hokkaido Shinbun Tokyo, Japan	Political Science	Northern Illinois University DeKalb, Illinois
Albrecht Jungk Professor of Plant Nutrition Technical University of Hanover Hanover, Germany	Animal and Plant Sciences	Purdue University Lafayette, Indiana
Ugur Korum Associate Professor of Statistics and Econometrics University of Ankara Faculty of Political Sciences Ankara, Turkey	Economics	University of Michigan, Ann Arbor, Michigan
Walter Liggens Professor of Modern History University of Saarland Saarbrucken, Germany	History	University of Missouri Columbia, Missouri
Boris Matkovic Head, X-Ray Laboratory Ruder Boskovic Institute Zagreb, Yugoslavia	Chemistry	University of Illinois Urbana, Illinois

Czeslaw Matusewicz Associate Professor Instructor of Psychology University of Adam Mickiewicz Poznan, Poland	Psychology	University of Michigan, Ann Arbor, Michigan
Juhani Mikola Research Fellow National Research Council for Technical Sciences Helsinki, Findland	Animal and Plant Sciences	U.S. Department of Agriculture, New Orleans, Louisiana
Evangelos Moutsopoulos Professor of Philosophy University of Athens Athens, Greece	Philosophy	Emory University Atlanta, Georgia
Tudor Andrei Mutiu Assistant Professor Civil Engineering Institute Bucharest, Romania	Engineering	Carnegie-Mellon University Pittsburgh, Pennsylvania
Hannu Juhanni Nurmi Research Assistant State Social Research Council Helsinki, Finland	Political Science	Johns Hopkins University Baltimore, Maryland
Stanislaw Piekarczyk Professor of History University of Warsaw Warsaw, Poland	History	University of Illinois Urbana, Illinois
Ignat Poinescu Senior Scientist Institute of Macromolecular Chemistry Iasi, Romania	Engineering	University of Michigan, Ann Arbor, Michigan
Marilyn Renfree Researcher Department of Zoology Australian National University Canberra, Australia	Animal and Plant Sciences	University of Tennessee Knoxville, Tennessee
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Photograph of Conference Participants